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GENCORP AEROJET

Integrated Advanced Microwave Sounding Unit-A (AMSU-A)

**Performance Verification Report** 

METSAT (S/N: 107) AMSU-A1 Receiver Assemblies

P/N 1356429-1, S/N: F04, P/N 1356409-1, S/N: F04

T.R. 1N-18

Contract No. NAS 5-32314 CDRL 208 2000 025 595

Submitted to:

National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Maryland 20771

Submitted by:

Aerojet 1100 West Hollyvale Street Azusa, California 91702



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## PERFORMANCE VERIFICATION TEST REPORT METSAT (S/N: 107) AMSU-A1 RECEIVER ASSEMBLIES FOR INTEGRATED ADVANCED MICROWAVE SOUNDING UNIT-A (AMSU-A)

CONTRACT NO. NAS5-32314 CDRL PAR 3.3.2.1

**FEBRUARY 1999** 

#### SUBMITTED TO

NATIONAL AERONAUTICS AND SPACE ADMINISTERATION GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771

SUBMITTED BY

AEROJET ELECTRONIC SYSTEMS PLANT 1100 WST HOLLYVALE STREET AZUSA, CALIFORNIA 91702

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#### AMSU-A RECEIVER VERIFICATION TEST REPORT

LEVEL OF ASSEMBLY:

**SUBASSEMBLY** 

**TEST ITEM:** 

**AMSU-A1 RECEIVER ASSEMBLY** 

P/N: 1356429-1, S/N: F04 P/N: 1356409-1, S/N: F04

TYPE OF HARDWARE:

METSAT FLIGHT MODEL (FM)

**TYPE OF TEST:** 

**FUNCTIONAL PERFORMANCE** 

**VERIFICATION TEST PROCEDURE:** AE-26002/6A

**TEST FACILITY LOCATION:** 

**AESP** 

**AZUSA, CALIFORNIA** 

**SIGNATURE:** 

TEST ENGINEER: JULIA DATE: 2/19/1999

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#### 1.0 INTRODUCTION

The AMSU-A receiver subsystem comprises two separated receiver assemblies; AMSU-A1 and AMSU-A2 (P/N 1356441-1). The AMSU-A1 receiver contains 13 channels and the AMSU-A2 receiver 2 channels. The AMSU-A1 receiver assembly is further divided into two parts; AMSU-A1-1 (P/N 1356429-1) and AMSU-A1-2 (P/N 1356409-1), which contain 9 and 4 channels, respectively. Figures 1 and 2 illustrate the functional block diagrams of the AMSU-A1 and AMSU-A2 receivers.

The AMSU-A receiver subsystem is located in between the antenna and signal processing subsystems of the AMSU-A instrument and comprises the RF and IF components from isolators to attenuators as shown in Figures 1 and 2. It receives the RF signals from the antenna subsystem, down-converts the RF signals to IF signals, amplifies and defines the IF signals to proper power level and frequency bandwidth as specified for each channel, and inputs the IF signals to the signal processing subsystem.

The test reports for the METSAT AMSU-A receiver subsystem are prepared separately for A1 and A2 receivers so that each receiver stands alone during integration of instruments into the spacecraft. This test report presents the test data of the METSAT AMSU-A1 Flight Model No. 4 (FM-4) receiver subsystem. The tests are performed per the Acceptance Test Procedure (ATP) for the AMSU-A Receiver Subsystem, AE-26002/6A. The functional performance tests are conducted either at the component or subsystem level. While the component-level tests are performed over the entire operating temperature range predicted by thermal analysis, most subsystem-level tests are conducted at ambient temperature only. Key performances (bandpass characteristics and noise figure) of the receiver subsystem are verified over the operating temperature.

#### 2.0 REASON FOR TEST

The ATP for the AMSU-A Receiver Subsystem, AE-26002/6A, is prepared to describe in detail the configuration of the test setups and how the tests are to be conducted to verify that the receiver subsystem meets the specifications as required either in the AMSU-A Instrument Performance and Operation Specification, S-480-80, or in AMSU-A Receiver Subsystem Specification, AE-26608, derived by the Aerojet System Engineering. Test results that verify the conformance to the specifications demonstrate the acceptability of that particular receiver subsystem.

#### 3.0 ACCEPTANCE TEST

The acceptance tests for the AMSU-A receiver subsystem are performed either at the component or subsystem level. The component-level tests are conducted per the ATP of

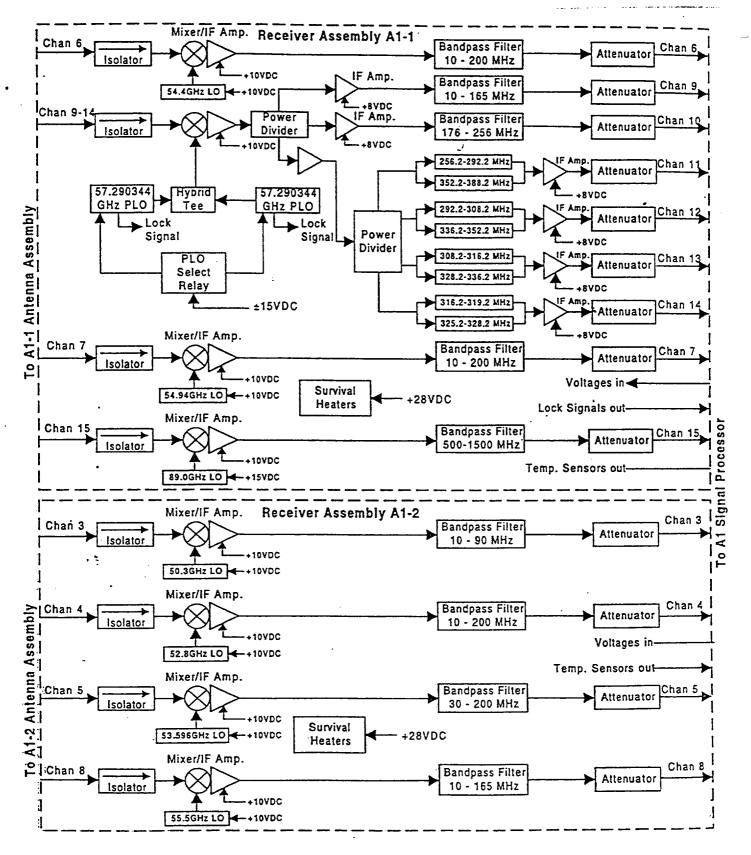


Figure 1. AMSU-A1 Receiver Functional Block Diagram

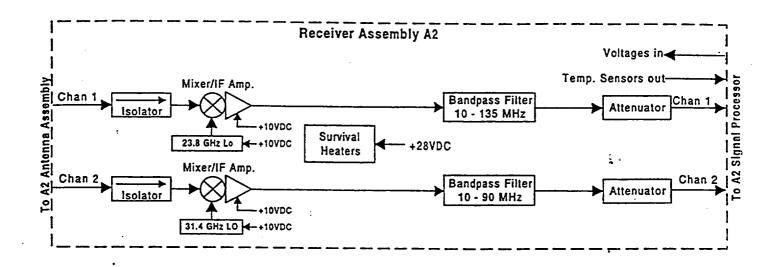


Figure 2. AMSU-A2 Receiver Functional Block Diagram

each component at supplier's facilities. The subsystem-level tests are conducted per the ATP, AE-26002/6A at Aerojet Azusa facility.

The component-level tests include the center frequency, center frequency stability, bandpass characteristics, gain stability, and gain compression. Although the bandpass characteristics can change slightly in subsystem level, these performances are mainly dependent on the component characteristics. The subsystem-level tests include the center frequency, IF output power, bandpass characteristics, noise figure, noise power stability, and the tunable short test.

The subsystem-level tests are performed on AMSU-A1 receivers: AMSU-A1-1 and AMSU-A1-2. However, since the multiplexers of the AMSU-A1 system are inseparably integrated to the receivers, the acceptance tests are conducted with the feedhorns directly connected to respective multiplexers that precede the receiver subsystem. These tests are performed at room ambient temperature.

Wire connections between the D-sub connectors and platinum resistance temperature (PRT) sensors and thermistors, the D-sub connector and PLO lock detection terminals, and the D-sub connector and survival heaters through the thermal switches are verified by measuring either the resistances between the respective two pins or the voltages across the respective two pins. The component bias voltages are verified by measuring the voltages across the two respective banana jacks of the breakout box that are connected to corresponding pins of the D-sub connector.

Because of the failures experienced in previous receivers, preliminary tests are incorporated prior to the acceptance tests from this AMSU-A1 receiver (S/N: FM4). The preliminary tests included the bandpass characteristics, noise figure and noise power stability. These tests were conducted on the receiver by temporarily mounting the components on the receiver shelf without bonding and wiring. High noise figure of 6dB was measured for channel 4 during the preliminary tests of the AMSU-A1-2 receiver. Efforts were made to improve the noise figure by replacing the DRO (P/N: 1336610-4, from S/N: 85042 to S/N: 85044), mixer/IF amplifier (P/N: 1331562-14, from S/N: 7A34 to S/N: 7A44), and isolator (P/N: 1356680-2, from S/N: 09 to S/N: 11), but the problem was finally traced to higher insertion loss of the multiplexer (P/N: 1331507, S/N: 03). The multiplexer (S/N: 03) was replaced by another (S/N: 05) and the replaced unit was sent back to the supplier for repair. The preliminary tests were conducted on channels 6, 7, 9, 10, and 15 for the AMSU-A1-1 receiver. Slightly high noise power stabilities were measured for channels 9 and 10 but lowered by adjusting the LO power level fore these channels.

During the acceptance tests, miswiring to channel 3 mixer/IF amplifier was revealed and corrected by reversing the connections. Other than that, the acceptance tests went smoothly for both AMSU-A1-1 and A1-2 receivers producing test results that meet all specified requirements.

Thermal cycling test was also implemented into the receiver tests starting with this AMSU-A1 receiver (S/N: FM4). Each receiver shelf was subjected to two thermal cycles between -20°C and +50°C and the bandpass characteristics and noise figure of the channels were measured at two temperature extremes of -20°C and +50°C as well as at room ambient temperature. For the A1-1 receiver, the tests were performed for channels 6, 9, and 10 during the first thermal cycle and for channels 7 and 15 during the second cycle. For the A1-2 receiver, the tests were performed for channels 3 and 4 during the first thermal cycle and for channels 5 and 8 during the second cycle. No anomaly was observed during temperature cycling of these receivers.

#### 4.0 ORGANIZATION OF TEST DATA

The test data are organized in the following formats. The test data obtained at the component level are first summarized for each category for all applicable receiver channels. The bandpass characteristics of the filters are summarized only for the data measured at mid-temperature. Supporting component test data over the operating temperature range then follows the summaries.

The subsystem-level test data are organized for each receiver (A1-1 and A1-2), but not necessarily in sequential order of tests performed. Test data recorded in the test sheet as prepared in the ATP and related data plots are included in this test report.

#### 5.0 SUMMARY AND RECOMMENDATIONS

The METSAT AMSU-A1 FM-4 receiver subsystem successfully passed all performance requirements and is delivered to System Engineering for system integration and test. The test data, in most cases, indicated adequate margins for key performance specifications. The tunable short test was not performed on this unit as it was performed on a previous receiver subsystem (S/N: FM-3).

To streamline the receiver tests, preliminary tests and thermal cycling test were incorporated into the AMSU-A1 receiver subsystem starting with this unit (S/N: F04). The preliminary tests were conducted on the receiver by temporarily mounting the components on the receiver shelf without bonding and wiring. In case of a performance anomaly or hardware failure, the problem could be corrected without going through the lengthy processes involved with disassembling and reassembling the completely assembled receiver hardware and associated document preparations as required when it occurs during the acceptance tests. The thermal cycling test was implemented to flush out any receiver failures experienced in system-level tests on previous instruments. As a consequence of the preliminary tests, the receiver acceptance tests went smoothly without an anomaly or a failure other than a minor miswiring problem.

#### 6.0 TEST DATA

In the following, the component and subsystem-level test data are organized as delineated in Paragraph 4.0.

COMPONENT-LEVEL TEST DATA

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1		

#### CENTER FREQUENCY AND FREQUENCY STABILITY

#### **FOR**

LOCAL OSCILLATORS (LOs) (DROs, PLOs, & GDO)

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Report No. 11413 February, 1999

## CENTER FREQUENCY OF LOS

Channel No.	3	4	ς.	9	7	8	9-14 *	15
Specification (GHz)	50.3	52.8	53.596	54.4	54.94	5.5.5	57.290344	89.0
Setting Accuracy (+/-GHz)	0.002	0.001	0.001	0.001	0.001	0.002	0.000086	0.03
Measured (GHz)	50.30018	52.80074	53.59641	54.40004	54.93930	55.50042	57.290332 57.290346	89.010

\* Measured for PLO No. 1 and No. 2.

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# FREQUENCY STABILITY OF LOS

15	80	30	50	+11.,		50	9/
9-14 *	0.086			+0.011,	+0.013,	0.114	0.115
8	9	2	9	+0.78,		2	0.1
7	3	<del></del>	2	+1.01,		2	0.1
9	3	-	2	+1.35,		2	0.1
5	3	<del></del>	2	+1.14,		2	0.1
4	3	-	2	+1.06,		2	0.1
3	8	2	9	+0.86,	:	2	0.1
Channel No.	Short-Term Specification (+/-MHz)	Setting Accuracy (+/-MHz)	W/ Temp. & Voltage (+/-MHz)	Measured (MHz) Total		<u>Long-Term</u> Specification (+/-MHz)	By Design or Analysis ** (+/-MHz)

Note: Additional +/-0.1MHz frequency stability reserved for safety margin for channels 11-14.

<sup>\*</sup> Measured for PLO No. 1 and No. 2.\*\* Based on accelerated life-test data for DROs.

Channel 3 LO

DRO (P/N: 1336610-3, S/N: 85093)

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## **TEST DATA SHEET 7.2**

S		CTIONAL PERFORMANCE TE FA SET <u>NA</u> FINAL DATA	•
<b>.Τ</b> .	.,	<del></del>	_
.E!	LITTON TYPE LSE 9036 AM		AESD 13366103
.C	SERIAL NUMBER: 85093	_ QUAL TEST N/A	ACCEPT TEST
.0	Basic Electrical Test; Ref. Test Para. 5.2.2		
	SPECIFICATION	MEASUREMENT AT Tnom:	±1°C LIMIT
	Measurement at Vop=10 VDC	<b>.</b> .	,
	Temperature	<u>22_</u> °c	Table IIIB
	Input Voltage	IOVDC	$10.0 \pm 0.2 \text{ VDC}$
	Input Current	<u> </u>	Table IIIB
	Input Power, P <sub>diss</sub>		P <sub>diss</sub> max
	Frequency, f <sub>Tnom</sub>	50.30018 GHz	Table IIIB
	RF Output Power, P <sub>Tnom</sub>	12.3 dBm	12 to 17 dBm
	Frequency Setting Accuracy,	0.18 MHz	
	$\Delta f_{S} (= f_{Tnom} - F_{o})$		
	Frequency and RF Output Power Variation V		
	Measurement at 9.5 VDC or at 9.5 VI		
p* •	Temperature	22°C	Table IIIB
( 9	Input Voltage	9. <u>S</u> VDC	9.5 VDC or Para. 5.2.3.2
	Input Current		Table IIIB
	Frequency, f <sub>meas</sub>	50.300 18 GHz	Table IIIB
$\overline{}$	RF Output Power, Pmeas	12.2 dBm	12 to 17 dBm
			<b>*</b>
	Measurement at 10.5 VDC or at 10.5 V		
	Temperature	<u>22_</u> •c	Table IIIB
	Input Voltage	10.5_ VDC	10.5 VDC or Para. 5.2.3.3
	Input Current	<u>178</u> mA	Table IIIB
	Frequency, f <sub>meas</sub>	50.30018 GHz	Table IIIB
	RF Output Power, P <sub>meas</sub> –	<u></u>	12 to 17 dBm
	Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{meas}$	Tnom»	
	Δf <sub>V</sub> at 9.5 VDC or at 9.5 VDC	= <u>d: MHz</u>	
	Δf <sub>V</sub> at 10.5 VDC or at 10.5 VDC		
	All at 10.5 v De of at 10.5	<del></del>	
	Calculate RF Output Power Variation, $\Delta P_V =$	P <sub>meas</sub> - P <sub>Tnom</sub> ,	
	ΔP <sub>V</sub> at 9.5 VDC or at 9.5 VDC	$C = \frac{-0.1}{\text{dB}}$	
	ΔP <sub>V</sub> at 10.5 VDC or at 10.5 VDC	<del></del>	
	Δεγ at 10.5 VDC of at 10.5		
1	A A	ccept Reject	
(_B	Toot Barfarmed by	Date 6-3-98	
	Test Performed by		
	Litton QA	Date <u>JUN 1 5 1998</u>	
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#### TEST DATA SHEET 7.3

FUNCTIO	NAL PEF	RFORMANCE TESTS	
INITIAL DATA SET	NA	FINAL DATA SET	

	-	
LITTON TYPE LSE 9036 AM		AESD 1336610- 3
SERIAL NUMBER: <u>85093</u>	QUAL TEST N/A	ACCEPT TEST
Temperature Testing at T=10°C, Ref. T	Cest Para. 5.2.5.1	
SPECIFICATION M	EASUREMENT AT T=10° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	10°C	$10^{\circ} \pm 1^{\circ}C$
Input Voltage	loVDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	179mA	Table IIIB
Input Power, P <sub>diss</sub>		Pdiss max
Frequency, f <sub>10°C</sub>	5080041 GHz	Table IIIB
RF Output Power, P <sub>10°C</sub>	12.2 dBm	12 to 17 dBm
•		
Frequency and RF Output Power Variate	tion With Voltage, Ref. Test Para  VDC	. 3.2.3.1
Measurement at 9.5 VDC or at <u>q.5</u>	_ <b>10 °C</b>	Table IIIB
Temperature	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Voltage	176 mA	Table IIIB
iput Current		Table IIIB
Frequency, f <sub>meas</sub>		12 to 17 dBm
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5	VDC	
Temperature	<u>lo</u> .c	Table IIIB
Input Voltage	10.5VDC	10.5 VDC or Para. 5.2.3.3
Input Current	<u>177</u> mA	Table IIIB
Frequency, f <sub>meas</sub>	50.300 41 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	12.2 dBm	12 to 17 dBm
•	<b>.</b> .	
Calculate Frequency Variation, $\Delta f_V = f_r$	DC =	7.
	$DC = \frac{\phi}{MH}$	
	= 0.23  MH	
$\Delta f_T$ at 10.0 VDC (= $f_{10^{\circ}C}$ - $f_{Tnom}$ )		•
Calculate RF Output Power Variation.	$\Delta P_{V} = P_{\text{meas}} - P_{10^{\circ}\text{C}}$ :	
	$DC = $ $\underline{\mathscr{C}} dB$	
	$DC = \underline{d} dB$	
$\Delta P_T$ at 10.0 VDC (= $P_{10^{\circ}C}$ - $P_{Tnom}$ )	= <u> </u>	
		Painet
est Performed by	Accept <u>/</u> Date 6-3-98	Reject
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Litton Q.A.	Date JUN 1.5	1990
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56348 A	1300823	B3
	DIVISION / 3251 OLCOTT ST /	SANTA CLARA, CA 95054

## TEST DATA SHEET 7.4 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET VA FINAL DATA SET

LITTON TYPE LS E 9036 AM SERIAL NUMBER: 85093	QUAL TEST N/A	AESD 13360 ACCEPT TE	
Temperature Extreme Testing at Tmin, Ref	Test Para. 5.2.5.2		
SPECIFICATION	MEASUREMENT AT	Tmin ±1°C '	LIMIT
Measurement at Vop=10 VDC Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>Tmin</sub> RF Output Power, P <sub>Tmin</sub>	l °C lO VDC 178 mA 1.78 W DC 50.3034 GHz 	10.0 : Table Pdiss Table	max
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at		Table 9.5 V Table Table	DC or Para 5.2.3.2 HIIB
Measurement at 10.5 VDC or at 10.5 Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	VDC °C VDC 177 mA MA GHz dBm	Table Table	VDC or Para 5.2.3.3 HIIB
Calculate Frequency Variation, $\Delta f_V = f_{meas} - \Delta f_V$ at 9.5 VDC or at 9.5 VDC = $\Delta f_V$ at 10.5 VDC or at 10.5 VDC = $\Delta f_T$ at 10.0 VDC (= $f_{Tmin}$ - $f_{Tnom}$ )	= · 0.0	MHz MHz MHz	
Calculate RF Output Power Variation, $\Delta P_V = \Delta P_V$ at 9.5 VDC or at $\underline{9.5}$ VDC = $\Delta P_V$ at 10.5 VDC or at $\underline{10.5}$ VDC = $\Delta P_T$ at 10.0 VDC (= $P_{Tmin}$ - $P_{Tnom}$ )	=	dB dB 2 dB	
Accept Sest Performed by Litton Q.A.	Date 6-3- Date JUN 1	5 1993	T 40 OF 60
CODE IDENT NO. SIZE   56348 A   LITTON / SOLID STATE DIVIS	NUMBER 1300823 SION / 3251 OLCOTT S'	B3	A, CA 95054

## TEST DATA SHEET 7.5 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_\_ FINAL DATA SET \_\_\_\_\_\_

INITIAL DATA 5.	EI N/A FINAL D	AIA SEI
LITTON TYPE LS E 9036 AM	- ovv. mar)/4	AESD 1336610- 3
SERIAL NUMBER: 85093	QUAL TEST N/A	ACCEPT TEST
Temperature Testing at T=30°C, Ref. Test	Para. 5.2.5.3	
SPECIFICATION	MEASUREMENT AT	T=30° ±1°C LIMIT
Measurement at Vop=10 VDC		
Temperature	<u>3</u> o∘C	$30^{\circ} \pm 1^{\circ}C$
Input Voltage	loVDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	· 179 mA	Table IIIB
Input Power, P <sub>diss</sub>	1.79 W DC	Pdiss max
Frequency, $f_{30^{\circ}C}$	50.30059 GHz	Table IIIB
RF Output Power, P <sub>30°C</sub>	12.3 dBm	12 to 17 dBm
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at9.5VTemperature		Para 5.2.5.3  Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
aput Current	177 mA	Table IIIB
Frequency, f <sub>meas</sub>	50.30059 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	12.3 dBm	12 to 17 dBm
ra output over, I meas		
Measurement at 10.5 VDC or at 10.5	VDC	
Temperature	<u>3</u> 0 ℃	Table IIIB
Input Voltage	(0.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	178 mA	Table IIIB
Frequency, f <sub>meas</sub>	50.30059 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	12.3 dBm	12 to 17 dBm
1d Justin 1 meas		
Calculate Frequency Variation, $\Delta f_V = f_{meas}$ $\Delta f_V$ at 9.5 VDC or at 9.5 VDC $\Delta f_V$ at 10.5 VDC or at 10.5 VDC $\Delta f_T$ at 10.0 VDC (= $f_{30^{\circ}C}$ - $f_{Tnom}$ )	= <u>d</u> = <u>4</u>	MHz MHz MHz
Calculate RF Output Power Variation, ΔP <sub>V</sub> ΔP <sub>V</sub> at 9.5 VDC or at 9.5 VDC		dB
ΔP <sub>v</sub> at 10.5 VDC or at 10.5 VDC	=	dB
$\Delta P_T$ at 10.0 VDC (= $P_{30^{\circ}C}$ - $P_{Tnom}$ )	,	dB
	Accept	Reject
est Performed by VN	Date C-3	
Litton Q.A.	Date JUN 1	5 <del>19</del> 93
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56348 A	1300823	B3
LITTON / SOLID STATE DIV	ISION / 3251 OLCOTT S	ST/SANTA CLARA, CA 95054

### TEST DATA SHEET 7.6 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/4 FINAL DATA SET

	ET_N/A_ FINAL DATA	
LITTON TYPE LS E 9036 AM		AFSD 1336610- 3
SERIAL NUMBER: 85093	QUAL TEST N/A	AESD 1336610- 3 ACCEPT TEST
Temperature Extreme Testing at Tmax, Ref	·	
SPECIFICATION	MEASUREMENT AT Tma	$ax \pm 1^{\circ}C$ , LIMIT
Measurement at Vop=10 VDC		
Temperature	44_°C	Table IIIB
Input Voltage	lo_VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	182mA	Table IIIB
Input Power, P <sub>diss</sub>		Pdiss max
Frequency, f <sub>Tmax</sub>	· <u>50.29983</u> GHz	Table IIIB
RF Output Power, P <sub>Tmax</sub>	2. dBm	12 to 17 dBm
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at 9.5 VDC		5.2.5.4
Temperature	44 °C	Table IIIB
Input Voltage	95 VDC	9.5 VDC or Para 5.2.3.2
out Current	180 mA	Table IIIB
rrequency, f <sub>meas</sub>	58.29981 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	12./ dBm	12 to 17 dBm
	VDC	12 10 17 10011
Temperature	44°C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para 5.2.3.3
Input Current	182 mA	Table IIIB
Frequency, f <sub>meas</sub>	50.29979 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	12.1 dBm	12 to 17 dBm
id Output 10 Wor, 1 meas		12 10 17 12 11
Calculate Frequency Variation, $\Delta f_V = f_{meas}$	· f <sub>Tmax</sub> :	
$\Delta f_V$ at 9.5 VDC or at 9.5 VDC	=	2
$\Delta f_V$ at 10.5 VDC or at 10.5 VDC	= <u>- 0.0 4</u> MHz	2
$\Delta f_T$ at 10.0V (= $f_{Tmax}$ - $f_{Tnom}$ )	= <u>- 0.35</u> MH	z
Calculate RF Output Power Variation, ΔP <sub>V</sub> ΔP <sub>V</sub> at 9.5 VDC or at 9.5 VDC	=dB	
ΔP <sub>V</sub> at 10.5 VDC or at 10.5 VDC	<del></del>	
$\Delta P_T$ at 10.0 VDC (= $P_{Tmax}$ - $P_{Tnom}$ )	= <u>-0'.2</u> dB	
st Performed by Litton Q.A.  Acce	Ppt Reject  Date 6-3-98  Date UN 1 5 19	
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### TEST DATA SHEET 7.7 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NA FINAL DATA SET

UTTON TIME IS 6	Δ	ESD 1336610-	 3	-
LITTON TYPELS E 9036 AM SERVAL MIRABER. 01141	TEST NA ACCEPT	TEST		
SERIAL NUMBER: <u>85093</u> QUAL	TEST NOTE ACCELLE			
Power Supply Immunity, Ref. Test Para, 5.2.4				
Fower Supply miniming. Ref. Test Laid. 200-1				
SPECIFICATION	MEASUREMENT AT Tron	ı±l°C	LIMIT	
Initial Measurement		•		
Temperature	<u>22_</u> °C	·	Table IIIB	
Input Voltage	loVDC		$10.0 \pm 0.2 \text{ VDC}$	
Input Current	ISO MA		Table IIIB	
Input Power	1.80 W DC		Pdiss max	
Frequency (f <sub>Tnom</sub> )	50.30007 GHz		Table IIIB	
RF Output Power	12.2 dBm		12 to 17 dBm	
Frequency Setting Accuracy, $\Delta f_S$ (= $f_{T_{nom}}$ - $F_o$ )	0.07 MHz			
Performance After Short Circuit on Power Supply:	Ref Test Para 5.2.4.2			
· VIII	_			į
Input Voltage	lovdc		10.0 ± 0.2 VDC	
Input Current	<u>18o</u> mA		Table IIIB	
Input Power			Pdiss max	-
Frequency	50.30008 GHz		Table IIIB	
RF Output Power	12.2 dBm		12 to 17 dBm	
)ver Voltage: Ref Test Para 5.2.4.3				
Overvoltage Input Voltage	28 VDC		+28V	
Performance After Input Overvoltage				
Input Voltage	lovdc		$10.0 \pm 0.2 \text{ VDC}$	
Input Current	[80 mA		Table IIIB	
Input Power	1.80 W DC		Pdiss max	
Frequency	50.300 to GHz		Table IIIB	
RF Output Power —	12.2 dBm		12 to 17 dBm	
·				
Reverse Polarity: Ref Test Para 5.2.4.4				
Reverse Input Voltage			$-10.0 \pm 0.2 \text{ VDC}$	•
Performance After Reverse Input Voltage				
Input Voltage	OVDC		10.0 ± 0.2 VDC	
Input Current	<u>180</u> mA		Table IIIB	
Input Power	1.80 W DC		Pdiss max	
Frequency, f <sub>Tnom</sub>	50.30014 GHz		Table IIIB	
RF Output Power	12.2 dBm		12 to 17 dBm	
Frequency Setting Accuracy, $\Delta f_S$ (= $f_{Tnom}$ - $F_o$ )	0.14 MHz			
•				
<b>Y</b> / • ·	ccept Reject	<del></del>		
Test Performed by	Date 6-3-98	_		_
Litton Q.A.	Date <u>JUN 1 5 1933</u>	_		
CODE IDENT NO.	NUMBER	REV	SHEET 43 OF 68	
56348 A	1300823	В3		
LITTON / SOLID STATE DIV	ISION / 3251 OLCOTT S	T / SANTA	CLARA, CA 95054	

## TEST DATA SHEET 7.22A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

INIT	IAL DATA SET	<u>N/A</u> FINAL	DATA SE	T	
LITTON TYPE LS E 9 SERIAL NUMBER: 8	036 AM 55093 (	QUAL TEST <u>ル</u>	<u>/</u> A	AESD 1336610ACCEPT TEST	3
Frequency and Power Hyste	resis: Ref Test Pa	ara. 5.8			
TEST DESCRIPTION			L	<u>IMIȚS</u>	
1. Initial Perform	mance at Tnom ±	1°C		·	
Temperature Frequency, $f_{Tnom}$ RF Output Power, $P_{Tnom}$ Input Voltage, $V_B$ Input Current. $I_B$ Frequency Setting Accuracy $\Delta f_S (= f_{Tnom} - F_o)$	50.30014 12.3 10 179	°C GHz dBm VDC mA MHz	Ta 12 10	nom ± 1°C able IIIB 2 to 17 dBm 0 ± 0.2 VDC able IIIB	<i>;</i>
2. Performance	at Tnom ± 1°C af	fter +60°C soak.			
Temperature requency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current	121 di 10 V	C GHz Bm /DC 1A	Ta 12 V	nom ± 1°C able IIIB 2 to 17 dBm <sub>B</sub> ± .005 VDC able IIIB	
3. Performance	at Tnom ± 1°C af	ter -30°C soak.			
Temperature Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current	12.2 dl	C SHz Bm TDC 1A	Ta 12 V <sub>i</sub>	nom ± 1°C able IIIB 2 to 17 dBm <sub>B</sub> ± .005 VDC able IIIB	
Calculate frequency variation $\Delta f_H$ after 60°C soak = $\Delta f_H$ after -30°C soak =	$\Delta f_H = f_{meas} - f_{Tm}$	0.23 MHz			
Calculate RF output power v $\Delta P_H$ = after 60°C soak = $\Delta P_H$ = after -30°C soak =	rariation, $\Delta P_H = P_H$	- 0-2 dB			
est Performed by Litton Q.A	VN (vox.)	Ac Date Date	JŪN	Reject 3 - 98 1 5 1998	

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	Α	1300823	B3	

## **TEST DATA SHEET 7.23A**

	UNCTIONAL PERFO			7
INITIAL DA	TA SET <u>N/a</u> 1	FINAL D	ATA SET _	
LITTON TYPE I C				AEGD 1226610 7
LITTON TYPE LS = 9036 A SERIAL NUMBER: 85 09		· N/		AESD 1336610- 3
SERIAL NUMBER: 8509	YOAL TEST		<u>t                                     </u>	ACCEPT TEST
Frequency Pulling and Load VSWR	2.5:1 max. all phases.	. Ref Tes	st Para. 5.9	
TEST DESCRIPTION			LIMI	? TS
TEST DESCRIPTION			<u> Livii</u>	10
Initial Measurement. Ref Test Par. 5	.9.1			
Temperature	<u>23</u> °C			± 5°C
Frequency	50.30007 GHz		Table	IIIB
RF Output Power	<u>।२.३</u> dBm		12 to	17 dBm
Input Voltage	VDC		$10 \pm 0$	0.2 VDC
Input Current	18O mA		Table	IIIB .
•				.*
Reference test. Ref. Test Para. 5.9.3				
Frequency, f <sub>Ref</sub>	50.30007 GHz		Table	IIIB
RF Output Power, P <sub>Ref</sub>	dBm			
a Suspendional, 1 Ref				
Load Pulling Test. Ref. Test Para. 5.	9.4			
Maximum Frequency, f <sub>meas</sub>	50 .30008 GHz		Table	IIIB
Minimum Frequency, f <sub>meas</sub>	50.30006 GHz		Table	
Maximum RF Output Power P <sub>meas</sub>	dBm		14010	
Minimum RF Output Power, P <sub>meas</sub>	dBm			
William Rd Output I Ower, I meas	ubiii			
Calculate maximum positive (f <sub>meas</sub> is	greater than face) and	negative	(f is less t	han fact frequency variation
$\Delta f_L = f_{\text{meas}} - f_{\text{Ref}}$	greater dian i Rei) and	gui.vo	(Imeas 15 1055 C	mair reef inequency variation,
Timeas TRef				
Maximum Positive $\Delta f_L =$	O.OI MHz			
Maximum Negative $\Delta f_L =$	MHz			
Waxiiidii Wegative Ail				
Calculate maximum positive (P <sub>meas</sub> i	s greater than PRef) and	d negativ	e (P <sub>meas</sub> is less	s than P <sub>Ref</sub> ) RF Output Power
Variation, $\Delta P_L = P_{meas} - P_{Ref}$ :	S Neb	Ü	· meas	
Table				
Maximum Positive $\Delta P_L = \frac{1}{2}$	<u>O.5</u> dB			
Maximum Negative $\Delta P_L =$	<u> </u>			
5 - 5		• .		
_	Accept R	eject		
Test Performed by	<del>8&gt;</del> 4	Date	6-3-98	
	68	Date	JUN 1.5	1008
Litton Q.A.	<u>E=</u> )	Date	4011 1 0	10.71
CODE IDENT NO. SIZE		₹	REV	SHEET 60 OF 68
56348 A	1300823		В3	

## TEST DATA SHEET 7.23B FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

INIT	IAL DATA SE	ET N/A FINA	L DATA SET _	
LITTON TYPE LS E 9 SERIAL NUMBER:	036 AM 35093	QUAL TEST	)/A	AESD 1336610- 3 ACCEPT TEST
Frequency Pulling and Load	H VSWR 2.5:1	max. all phases. Ref	Test Para. 5.9	<b>!</b>
TEST DESCRIPTION			LIMI	<u>TS</u>
Output Open and Short. Re	f. Test Para. 5.9	9.5		
Temperature Frequency: RF Output Power: Input Voltage Input Current: Results:	23 50.300k 12.3 10 180	_ dBm	Table 12 to 10 ± Table	± 5°C e IIIB 17 dBm 0.2 VDC e IIIB Damage or Degradation
Iculate maximum Freque $L_{acc} = \Delta f_S$ (Use worst-case)	ency Accuracy $\Delta f_S$ from 7.2,	(both positive and negrees, 7.7, and 7.22A) + $\Delta f$	gative), <sub>H</sub> (from 7.22A) +	- Δf <sub>L</sub> (from 7.23A):
Maximum $\Delta f_{acc} =$	0.42	MHz (Positive) MHz (Negative)	Table	e IIIB e IIIB
Calculate maximum Short- $\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use wo	term Frequency erst-case Δf <sub>V</sub> an	y Stability (both posit d $\Delta f_T$ from 7.2 thru 7	ive and negative .6):	),
Maximum $\Delta f_{V+T} =$	<u>0.44</u> - 0.39	MHz (Positive) MHz (Negative)		e IIIB e IIIB
Calculate maximum overal $\Delta P_{OV} = \Delta P_{V} + \Delta P_{T}$ (Use v	I RF Output Po vorst-case ΔP <sub>V</sub>	ower Stability (both pand $\Delta P_T$ from 7.2 thru	ositive and negat $(7.6) + \Delta P_H$ (from	tive), m 7.22A) + $\Delta P_L$ (from 7.23A):
Maximum $\Delta P_{OV} =$	0.5 0,9	dB (Positive) dB (Negative)	1.0 d -1.0	
	Ac	cept Rejec	i	
Test Performed by	DH	Da	te <u>6-3-98</u>	
Litton Q.A.	(	Da Da	te JUN 15	1998
CODE IDENT NO. 56348	SIZE A	NUMBER 1300823	REV B3	SHEET 61 OF 68
LITTON / SOL	ID STATE DI	VISION / 3251 OLCO	OTT ST / SANTA	A CLARA, CA 95054

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#### Channel 4 LO

DRO (P/N: 1336610-4, S/N: 85044)

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## TEST DATA SHEET 7.2 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

		<del></del>
LITTON TYPE LS & 9036 AF/A		AESD 1336610-4
SERIAL NUMBER: 85044	QUAL TEST N/A	ACCEPT TEST _
Basic Electrical Test; Ref. Test Para. 5.2.2		
SPECIFICATION	MEASUREMENT AT Tnom ±	LIMIT LIMIT
Measurement at Vop=10 VDC	00	
Temperature	°C	Table IIIB
Input Voltage	VDC	10.0 ± 0.2 VDC
Input Current	176 mA	Table IIIB
Input Power, P <sub>diss</sub>	1.76 W DC	P <sub>diss</sub> max
Frequency, f <sub>Tnom</sub>	5280074 GHz	Table IIIB
RF Output Power, P <sub>Tnom</sub>	12.1 dBm 6.74 MHz	12 to 17 dBm
Frequency Setting Accuracy, $\Delta f_S (= f_{Tnom} - F_o)$		
Frequency and RF Output Power Variation Wi	th Voltage, Ref. Test Para 5.2.3	
Measurement at 9.5 VDC or atQ.5VDC		
Temperature	<u>22</u> °C	Table IIIB
Input Voltage		9.5 VDC or Para. 5.2.3.2
'nput Current	<b>!</b> ]4mA	Table IIIB
rrequency, f <sub>meas</sub>	5280074 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VD	c	
Temperature	<u>22</u> °C	Table IIIB
Input Voltage	10.5VDC	10.5 VDC or Para. 5.2.3.3
Input Current	<u>175</u> mA	Table IIIB
Frequency, f <sub>meas</sub>	<u>52800ባ</u> Δ GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tr}$	попъ	
Δf <sub>V</sub> at 9.5 VDC or at <b>Q.5</b> VDC	= <u>Ø</u> MHz	
Δf <sub>V</sub> at 10.5 VDC or at 10.5 VDC	_	
Calculate RF Output Power Variation, $\Delta P_V = 1$	P <sub>meas</sub> - P <sub>Tnom</sub> ,	
ΔP <sub>v</sub> at 9.5 VDC or at 9.5 VDC	= <u>6</u> dB	
$\Delta P_V$ at 10.5 VDC or at 10.5 VDC		
	,	
Ac	cept Reject	
Test Performed by Litton QA	Date <u>7-25-98</u> Date <u>JUL 2 9 1998</u>	
CODE IDENT NO. SIZE		SHEET 38 OF 68
56348 I A I	1300823	B3

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

### TEST DATA SHEET 7.3 FUNCTIONAL PERFORMANCE TESTS NITIAL DATA SET MIA FINAL DATA SET

INITIAL DATA	SET N/A FINAL DA	ATA SET /
LITTON TYPE LSE 9036 AFIA	·	AESD 1336610- 4
SERIAL NUMBER: <u>\$5044</u>	QUAL TEST <u>N/A</u>	ACCEPT TEST
Temperature Testing at T=10°C, Ref.	Test Para. 5.2.5.1	
SPECIFICATION M	TEASUREMENT AT T=10° ±	=1°C LIMIT
Measurement at Vop=10 VDC		
Temperature	0°C	10° ± 1°C
Input Voltage	10VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current		Table IIIB
Input Power, P <sub>diss</sub>		Pdiss max
Frequency, f <sub>10°C</sub>	5280049 GHz	Table IIIB
RF Output Power, P <sub>10°C</sub>	12.0 dBm	12 to 17 dBm
Frequency and RF Output Power Varia	ation With Voltage, Ref. Test l	Para 5.2.5.1
Measurement at 9.5 VDC or at	VDC	
Temperature	10°C	Table IIIB
Input Voltage	<b>9.5</b> VDC	9.5 VDC or Para. 5.2.3.2
Input Current		Table IIIB
Frequency, f <sub>meas</sub>	5280049 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	<u>12.0</u> dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5	SVDC	
Temperature	0 °C	Table IIIB
Input Voltage	<b>.</b> WDC	10.5 VDC or Para. 5.2.3.3
Input Current	174mA	Table IIIB
Frequency, f <sub>meas</sub>	5280048 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>		12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = \frac{1}{2}$	f <sub>meas</sub> - f <sub>10°C</sub> :	
		MHz
$\Delta f_V$ at 10.5 VDC or at <u>10.5</u>		MHz
$\Delta f_T$ at 10.0 VDC (= $f_{10^{\circ}C}$ - $f_{Tnom}$ )	= <u>-Ø.25</u>	MHz
Calculate RF Output Power Variation	$\Delta P_{V} = P_{\text{meas}} - P_{10^{\circ}\text{C}}$	
	VDC =	dB
	VDC =	dB
$\Delta P_T$ at 10.0 VDC (= $P_{10^{\circ}C}$ - $P_{T_{norm}}$ )	= -0.1	dB
	<u> </u>	/ Point
	Accept 0.26	<del></del>
Test Performed by JED 75	Date <u>7-25</u>	
Litton Q.A.	Date JUL	2 9 1998
CODE IDENT NO. SIZE	NUMBER	REV   SHEET 39 OF 68
K i	1300823	B3
56348 A	1500025	

### TEST DATA SHEET 7.4 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

INITIAL DATA SET	N/A FINAL DATA	SET 🗸
LITTON TYPE LS E 4036 AF A SERIAL NUMBER: 85044	QUAL TEST N/A	AESD 1336610- 4 ACCEPT TEST
Temperature Extreme Testing at Tmin, Ref	f. Test Para. 5.2.5.2	
SPECIFICATION	MEASUREMENT AT Tmir	±1°C LIMIT
Measurement at Vop=10 VDC Temperature Input Voltage Input Current Input Power, P <sub>diss</sub>	-1 °C 10 VDC 111 mA 1.11 W DC	Table IIIB  10.0 ± 0.2 VDC  Table IIIB  Pdiss max
Frequency, f <sub>Tmin</sub> RF Output Power, P <sub>Tmin</sub>	52 79994 GHz	Table IIIB 12 to 17 dBm
Frequency and RF Output Power Variation	DC °C	Table IIIB
Input Voltage	<u>9.5</u> VDC	9.5 VDC or Para 5.2.3.2
'nput Current	174 mA	Table IIIB
Frequency, f <sub>meas</sub>	<u>529989</u> GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at $10.5$ Temperature Input Voltage Input Current Frequency, $f_{meas}$ RF Output Power, $P_{meas}$	VDC°C	Table IIIB 10.5 VDC or Para 5.2.3.3 Table IIIB Table IIIB 12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = f_{meas}$ . $\Delta f_V = 9.5 \text{ VDC}$ or at $9.5 \text$	= -0.05	MHz MHz MHz
Calculate RF Output Power Variation, $\Delta P_V$ $\Delta P_V$ at 9.5 VDC or at <u>9.5</u> VDC $\Delta P_V$ at 10.5 VDC or at <u>10.5</u> VDC $\Delta P_T$ at 10.0 VDC (= $P_{Tmin}$ - $P_{Tnom}$ )	=	_ dB _ dB _ dB
Test Performed by Litton Q.A.  Acce	Date <u>7 - 25 - 98</u> Date <u>JUL 2 9 19</u>	
CODE IDENT NO. SIZE		EV SHEET 40 OF 68
56348 A		ANTA CLADA CA 05054
LITTON / SOLID STATE DIV	1810N / 3231 OLCOTT 81 / 8	ANTA CLAKA, CA 95054

# TEST DATA SHEET 7.5 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

LITTON TYPE LS E 9036 AF /A		AESD 1336610- 4
SERIAL NUMBER: 85044	QUAL TEST N/A	ACCEPT TEST
<del></del>		
Temperature Testing at T=30°C, Ref. Te	st Para. 5.2.5.3	
SPECIFICATION	MEASUREMENT AT	TT=30° ±1°C LIMIT
Measurement at Vop=10 VDC	_	
Temperature -	<u>30</u> °C	30° ± 1°C
Input Voltage	10VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current		Table IIIB
Input Power, P <sub>diss</sub>		
Frequency, f <sub>30°C</sub>	<u>5280063</u> GHz	Table IIIB
RF Output Power, P <sub>30°C</sub>		12 to 17 dBm
Frequency and RF Output Power Variat	ion With Voltage, Ref. Tes	t Para 5.2.5.3
Measurement at 9.5 VDC or at <u>9.5</u>	VDC	
Temperature	<b>3</b> 0°C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	175 mA	Table IIIB
Frequency, f <sub>meas</sub>	5280066 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	11.8 dBm	12 to 17 dBm
id output io wor, i mess		
Measurement at 10.5 VDC or at	VDC	
Temperature	<u>3</u> 0°C	Table IIIB
Input Voltage	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	!?しmA	Table IIIB
Frequency, f <sub>meas</sub>	5280014 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = f_i$	f20°C:	
Afv at 9.5 VDC or at 9.5 V	$DC = \frac{6.03}{}$	_ MHz
	$DC = \frac{\theta.0b}{}$	_ MHz
$\Delta f_T$ at 10.0 VDC (= $f_{30^{\circ}C}$ - $f_{Tnom}$ )	= -0.11	_ MHz
, , , , , , , , , , , , , , , , , , , ,		•
Calculate RF Output Power Variation,		dB
	DC	_ dB _ dB
21 V dt 10.5 12 0 01 11 11 11 11 11	<del></del>	
$\Delta P_T$ at 10.0 VDC (= $P_{30^{\circ}C}$ - $P_{Tnom}$ )	=	dB
	Accept	✓ Reject
Test Performed by		15-98
		2 9 1998
Litton Q.A.	. 200	<del>~</del>
CODE IDENT NO. SIZE	NUMBER	REV SHEET 41 OF 68
56348 A	1300823	B3
LITTON / SOLID STATE	DIVISION / 3251 OLCOT	T ST / SANTA CLARA, CA 95054

### TEST DATA SHEET 7.6 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

INIT	AL DITTIL			
LITTON TYPE LSE 9036 A	FIA			1336610- 4
SERIAL NUMBER: 85044	<u> </u>	QUAL TEST NA	_ ACCE	PT TEST
Temperature Extreme Testing	at Tmax, R	ef. Test Para. 5.2.5.4		
SPECIFICATION		MEASUREMENT AT T	Cmax ±1°C	LIMIT
Measurement at Vop=10 VD	C	•		
Temperature		<u>44</u> °C		Table IIIB
Input Voltage		VDC		$10.0 \pm 0.2 \text{ VDC}$
Input Current		<u>179</u> mA		Table IIIB
Input Power, P <sub>diss</sub>		<u>I.79</u> W DC		Pdiss max
Frequency, f <sub>Tmax</sub>		5280085 GHz		Table IIIB
RF Output Power, P <sub>Tmax</sub>		dBm		12 to 17 dBm
Frequency and RF Output Po			ara 5.2.5.4	
Measurement at 9.5 VDC or	at <u>9.5</u>	VDC		
Temperature		<u>44</u> °C		Table IIIB
Input Voltage		9.5VDC		9.5 VDC or Para 5.2.3.2
Input Current		<u>                                  </u>		Table IIIB
Frequency, f <sub>meas</sub>		<u>5280083</u> GHz		Table IIIB
RF Output Power, P <sub>meas</sub>		11.8dBm		12 to 17 dBm
Measurement at 10.5 VDC or	rat 10.5	VDC		
Temperature		<u>44</u> °C		Table IIIB
Input Voltage		W.5 VDC		10.5 VDC or Para 5.2.3.3
Input Current		INS mA		Table IIIB
Frequency, $f_{meas}$		5280082 GHz		Table IIIB
RF Output Power, P <sub>meas</sub>		11.8 dBm		12 to 17 dBm
Id Output I ower, I meas				
Calculate Frequency Variation		as - f <sub>Tmax</sub> :	<b>л</b> т_	
$\Delta f_V$ at 9.5 VDC or at <u>9.5</u>			∕IHz	
Δf <sub>V</sub> at 10.5 VDC or at 10.5	VD	<del></del>	ИHz	
$\Delta f_T$ at 10.0V (= $f_{Tmax}$ - $f_{Tnom}$ )		= 0.11	MHz	
Calculate RF Output Power	Variation, Δ	$P_V = P_{meas} - P_{Tnom}$ :		
$\Delta P_{\rm V}$ at 9.5 VDC or at 9.5			iB	
$\Delta P_V$ at 10.5 VDC or at 10.5		$C = \emptyset$	iΒ	
$\Delta P_T$ at 10.0 VDC (= $P_{Tmax}$ - $P_T$	<del></del>		iΒ	
Lat 10.0 v DO ( 1 max 1				
	A	ccept Reject		
Test Performed by		Date		
Litton Q.A.	—(filler,)	Date JUL 2 S	9 1998	
	11 63			
CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
CODE IDENT NO.	7122	1300823	B3	İ

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

### TEST DATA SHEET 7.7 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_\_ FINAL DATA SET \_\_\_\_\_\_

	<del></del>	-
LITTON TYPE LSE 4036 AF IA		6610- 4
SERIAL NUMBER: <u><b>85044</b></u> QUAI	L TEST <u>N/A</u> ACCEPT TEST	
Power Supply Immunity, Ref. Test Para, 5,2,4		
SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Initial Measurement		
Temperature	<b>22</b> °C	Table IIIB
Input Voltage	10.0 VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	178mA	Table IIIB
Input Power	1.78 W DC	Pdiss max
Frequency (f <sub>Tnom</sub> )	5280079 GHz	Table IIIB
RF Output Power	12.0 dBm	12 to 17 dBm
Frequency Setting Accuracy, $\Delta f_S = f_{Tnom} - F_o$	6.79 MHz	
Performance After Short Circuit on Power Supply:	Ref Test Para 5.2.4.2	
Input Voltage		10.0 ± 0.2 VDC
Input Current	ITT mA	Table IIIB
Input Power		Pdiss max
Frequency	5280071 GHz	Table IIIB
RF Output Power	dBm	12 to 17 dBm
Over Voltage: Ref Test Para 5,2.4.3		
Overvoltage Input Voltage		+28V
Performance After Input Overvoltage		
Input Voltage	VDC	10.0 ± 0.2 VDC
Input Current		Table IIIB
Input Power		Pdiss max
Frequency	5280076 GHz	Table IIIB
RF Output Power	dBm .	12 to 17 dBm
Reverse Polarity: Ref Test Para 5.2.4.4		
Reverse Input Voltage		$-10.0 \pm 0.2 \text{ VDC}$
Performance After Reverse Input Voltage		
Input Voltage		10.0 ± 0.2 VDC
Input Current	17(, mA	Table IIIB
Input Power	L つし W DC	Pdiss max
Frequency, f <sub>Tnom</sub>	5280070 GHz	Table IIIB
RF Output Power	12.1 dBm	12 to 17 dBm
Frequency Setting Accuracy, $\Delta f_s$ (= $f_{Tnom}$ - $F_o$ )	6.60 MHz	12 10 17 12
	Accept Reject	
	Accept V Reject Date 1-25-98	
Test Performed by JED	D .	
Litton Q.A. (LITTON)	- JUL & J 1990	
CODE IDENT NO. SIZE	NUMBER REV	SHEET 43 OF 68
56348 A	1300823 B3	
LITTON / SOLID STATE DIV	VISION / 3251 OLCOTT ST / SAI	NTA CLARA, CA 95054

### TEST DATA SHEET 7.22A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET AND FINAL DATA SET

INITIAL DATA	A SEINAL D	AIA DLI
LITTON TYPE LSE 9036 AFIA		AESD 1336610-4
SERIAL NUMBER: 85044	QUAL TEST <u>N/A</u>	ACCEPT TEST
Frequency and Power Hysteresis: Ref	Test Para. 5.8	
TEST DESCRIPTION		LIMITS
1. Initial Performance at 7	Tnom ± 1°C	
Temperature 2	2 ℃	Tnom ± 1°C
Frequency, f <sub>Tnom</sub> 5280	0084 GHz	Table IIIB
	2.0 dBm	12 to 17 dBm
, 1110tii	0 VDC	$10 \pm 0.2 \text{ VDC}$
	IT mA	Table IIIB
• — —	84 MHz	
$\Delta f_S (= f_{Tnom} - F_o)$		
2. Performance at Tnom	± 1°C after +60°C soak.	
Temperature 22	°C	$Tnom \pm 1$ °C
Frequency, f <sub>meas</sub> 5280	078 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	0 dBm	12 to 17 dBm
Input Voltage 10	VDC	$V_B \pm .005 \text{ VDC}$
Input Current	8mA	Table IIIB
3. Performance at Tnom :	± 1°C after -30°C soak.	
Temperature 22	°C	$Tnom \pm 1$ °C
Frequency, f <sub>meas</sub> 5280	0 29 GHz	Table IIIB
RF Output Power, P <sub>meas</sub> 11.	dBm	12 to 17 dBm
Input Voltage 10	VDC	$V_B \pm .005 \text{ VDC}$
Input Current 17	<u>n</u> mA	Table IIIB
Calculate frequency variation, $\Delta f_H = f$	f <sub>meas</sub> - f <sub>Tnom</sub> :	
$\Delta f_H$ after 60°C soak =	MHz	
$\Delta f_H$ after -30°C soak =	<u>- 6.55</u> MHz	
Calculate RF output power variation,	$\Delta P_{H} = P_{meas} - P_{Tnom}$ :	
$\Delta P_{H}$ = after 60°C soak =	<b>ø</b> dB	
$\Delta P_{H}$ = after -30°C soak =	0.4 dB	
		no.
	Acce	·
Test Performed by JED	Date	7-25-98
Litton Q.A.	Date	JUL 2 9 1998
CODE IDENT NO. SIZE	NUMBER	REV SHEET 58 OF 68
56348 A	1300823	B3
LITTON / SOLID STATE	DIVISION / 3251 OLCOTT	ST / SANTA CLARA, CA 95054

## TEST DATA SHEET 7.23A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_\_ FINAL DATA SET \_\_\_\_\_\_

HATELE DIT				
LITTON TYPE LS & 90310 AF IA			AESD 1336610-	
SERIAL NUMBER: 85044	QUAL TEST	NIA	ACCEPT TEST	<u>/</u>
Frequency Pulling and Load VSWR	2.5:1 max. all phases. Re	ef Test Para. 5	5.9	
TEST DESCRIPTION		J	LIMITS	
Initial Measurement. Ref Test Par. 5				
Temperature	<u>23</u> °C		24°C ± 5°C	
Frequency	52.80061 GHz		Table IIIB	
RF Output Power	dBm		12 to 17 dBm	•
Input Voltage	VDC		10 ± 0.2 VDC	
Input Current	<u>177</u> mA		Table IIIB	
Reference test. Ref. Test Para. 5.9.3				•
Frequency, f <sub>Ref</sub>	52.80061 GHz		Table IIIB	
RF Output Power, P <sub>Ref</sub>	dBm			
Catpat Tower, T Ret				
Load Pulling Test. Ref. Test Para. 5	5.9.4			
Maximum Frequency, f <sub>meas</sub>	52.80062 GHz		Table IIIB	
Minimum Frequency, f <sub>meas</sub>	52.80061 GHz		Table IIIB	
Maximum RF Output Power P <sub>meas</sub>	2.7dBm			
Minimum RF Output Power, P <sub>meas</sub>	dBm			
Calculate maximum positive ( $f_{meas}$ $\Delta f_L = f_{meas} - f_{Ref}$ .	is greater than f <sub>Ref</sub> ) and no	egative (f <sub>meas</sub> is	s less than $f_{Ref}$ ) frequenc	y variation,
Maximum Positive $\Delta f_L =$	O.OMHz			
Maximum Negative $\Delta f_L =$	MHz			
Calculate maximum positive ( $P_{meas}$ ) Variation, $\Delta P_L = P_{meas} - P_{Ref}$ :	$_{s}$ is greater than $P_{Ref}$ ) and $r$	negative (P <sub>meas</sub>	s is less than P <sub>Ref</sub> ) RF Ou	ıtput Power
Maximum Positive $\Delta P_L =$	<u>0.1</u> dB			
Maximum Negative $\Delta P_L =$	dB			
<b>5</b>	Accept Rej	ject		
Total Denfermed has	on —	Date7_2	27-98	
Test Performed by			JL 2 9 1998	
Litton Q.A.	Mean)			
CODE IDENT NO. SI	ZE NUMBER	1	EV SHEET 60 OF	68
56348	1300823		33	
LITTON / SOLID STA	TE DIVISION / 3251 OL	COTT ST/S	ANTA CLARA, CA 95	5054

## TEST DATA SHEET 7.23B FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_\_\_\_ FINAL DATA SET \_\_\_\_\_\_\_\_

INITIAL DATA SET N/A FINAL DATA SET /								
LITTON TYPE LS & 9036 / SERIAL NUMBER: 8504		QUAL TEST	NIA		AESD 1336610- 4 ACCEPT TEST			
Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9								
TEST DESCRIPTION				LIMIT	S			
Output Open and Short. Ref.	Output Open and Short. Ref. Test Para. 5.9.5							
Temperature Frequency: RF Output Power: Input Voltage Input Current: Results:	23 52.8006 121 10 177	_dBm _VDC _mA _Acceptable		10 ± 0. Table 1	IIIB 7 dBm 2 VDC			
Calculate maximum Frequer $\Delta f_{acc} = \Delta f_S$ (Use worst-case	ncy Accuracy ( Δf <sub>S</sub> from 7.2,	both positive and $(7.7, \text{ and } 7.22A) +$	negative), Δf <sub>H</sub> (from	7.22A) + <i>L</i>	Af <sub>L</sub> (from 7.23A):			
Maximum $\Delta f_{acc} =$	0·85 -0.55	MHz (Positive) MHz (Negative		Table l Table l				
Calculate maximum Short-to $\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use wor	erm Frequency st-case Δf <sub>V</sub> and	Stability (both po $1 \Delta f_T$ from 7.2 thru	sitive and 1	negative),				
Maximum $\Delta f_{V+T} =$	047 0.87	MHz (Positive) MHz (Negative		Table I				
Calculate maximum overall $\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use we	RF Output Poorst-case ΔP <sub>V</sub> a	wer Stability (both and $\Delta P_T$ from 7.2 the	positive a aru 7.6) + 2	nd negativ ∆P <sub>H</sub> (from	7.22A) + $\Delta P_L$ (from 7.23A):			
Maximum $\Delta P_{OV} =$	0.4	dB (Positive) dB (Negative)		1.0 dB -1.0 dI				
	Acc	ept Rej	ect	<u>_</u>				
Test Performed by	øн_		Date	27-98	<del></del>			
Litton Q.A.		MITCA)	Date	JUL 2	9 1998			
CODE IDENT NO.	SIZE	NUMBER		REV	SHEET 61 OF 68			
56348	A	1300823		B3				

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			end.
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**Channel 5 LO** 

DRO (P/N: 1336610-5, S/N: 85032)

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## TEST DATA SHEET 7.2 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_ FINAL DATA SET \_\_\_\_\_

LITTON TYPE LS E	7036AG/A		AESE	1336610- 5
SERIAL NUMBER:	85032	QUAL TEST _ ん/		EPT TEST
Basic Electrical Test; Ref.	. Test Para. 5.2.2			
SPECIFICATION		MEASUREMENT AT	Tnom ±1°C	LIMIT
Measurement at Vop=10	VDC			
Temperature		°C		Table IIIB
Input Voltage		VDC		$10.0 \pm 0.2 \text{ VDC}$
Input Current				Table IIIB
Input Power, P <sub>diss</sub>		W DC		P <sub>diss</sub> max
Frequency, f <sub>Tnom</sub>		53.59641 GHz		Table IIIB
RF Output Power, P <sub>Tnom</sub>		12.6dBm		12 to 17 dBm
Frequency Setting Accura	icy,	<u>0.41</u> MHz		
$\Delta f_S (= f_{Tnom} - F_o)$		,		
Frequency and RF Output Measurement at 9.5 VDC	Power Variation Wit	h Voltage, Ref. Test Para	5.2.3	·
Temperature	or at VDC	হ2 °C		Table IIID
Input Voltage		9.5 VDC		Table IIIB 9.5 VDC or Para. 5.2.3.2
Input Current		175 mA		Table IIIB
quency, f <sub>meas</sub>		<u>53.59642</u> GHz		Table IIIB
RF Output Power, Pmeas		12-6 dBm		12 to 17 dBm
Measurement at 10.5 VD(	C or at <u>10.5</u> VD(			
Temperature		<u>55</u> .€		Table IIIB
Input Voltage		10.5 VDC		10.5 VDC or Para. 5.2.3.3
Input Current		176mA		Table IIIB
Frequency, f <sub>meas</sub>		53.59643 GHz		Table IIIB
RF Output Power, Pmeas		12.6dBm		12 to 17 dBm
Calculate Frequency Varia	ation. $\Delta f_V = f_{meas} - f_{Tac}$	om,		
Δf <sub>V</sub> at 9.5 VDC or at	7.5 VDC =	0.01	MHz	
$\Delta f_V$ at 10.5 VDC or at	0.5 VDC =	0.02	_MHz	
Calculate RF Output Pow	er Variation. $\Delta P_{v} = P_{0}$	<sub>meas</sub> - P <sub>Tnom</sub> ,		
ΔP <sub>V</sub> at 9.5 VDC or at	7. <i>5</i> VDC =	. 0	_dB	
2P <sub>v</sub> at 10.5 VDC or at			₫B	
	.Acc	ept Reject		
Test Performed by	2-1	Dara 6 2 00		
on QA		Date 6-3-98 Date JUN 1 5 1998		
CODE IDENT NO.	(2,04)	NUMBER	REV	CUTET 20 OF 40
56348	SIZE	1300823	B3	SHEET 38 OF 68
	A			
111108/80	ういわ シチメ は りしじ	SION 3251 OLCOTT	) F. : 1	- ビボ <i>バイ、C.ユ</i> ードンリンチ

## TEST DATA SHEET 7.3 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NA FINAL DATA SET

	7		<del></del>
LITTON TYPE LS E 9036 AG/A SERIAL NUMBER: 85032	QUAL TEST _	U/A	AESD 1336610- 5 ACCEPT TEST
Temperature Testing at T=10°C. Ref. Test	Para. 5.2.5.1		
SPECIFICATION MEA	SUREMENT AT	T=10° ±1°C	LIMIT
Measurement at Vop=10 VDC Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>10°C</sub> RF Output Power, P <sub>10°C</sub>	10 177 1.77 53.59576	°C VDC mA W DC GHz dBm	10° ± 1°C 10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at 9.5 VTemperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	/DC 10 9.5 174 53.59576	°C VDC mA	Table IIIB 9.5 VDC or Para. 5.2.3.2 Table IIIB Table IIIB 12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	10.5 175 53.59576	°C VDC mA GHz dBm	Table IIIB 10.5 VDC or Para. 5.2.3.3 Table IIIB Table IIIB 12 to 17 dBm
Calculate Frequency Variation. $\Delta f_V = f_{meas}$ . $\Delta f_V$ at 9.5 VDC or at $9.5$ VDC $\Delta f_V$ at 10.5 VDC or at $10.5$ VDC $\Delta f_T$ at 10.0 VDC $(=f_{10^{\circ}C}-f_{Tnom})$	=	MHz  MHz  G5  MHz	
Calculate RF Output Power Variation. $\Delta P_V$ $\Delta P_V$ at 9.5 VDC or at $Q.S$ VDC $\Delta P_V$ at 10.5 VDC or at $Q.S$ VDC $\Delta P_T$ at 10.0 VDC (= $P_{10^{\circ}C}$ - $P_{Tnom}$ )	=	<u>φ</u> dB φ dB 0.3 dB	
Test Performed by Litton Q.A.	Date Date	Accept	Reject - -
CODE IDENT NO. SIZE  56348 A  LITTON / SOLID STATE DIV	NUMBER 1300823 ISION - 3251-010	RE\   B3   COTT ST / SA)	

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INIII	AL DATA SET	N/A	FINAL DATA	SET		
LITTON TYPE LS E SERIAL NUMBER:	7036 AG/A 85032	QUAL TEST	N/A		1336610 PT TEST _	5
Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2						
SPECIFICATION		MEASUREM	ENT AT Tmin	<u>±1°C</u>	LIM	III
Measurement at Vop=10 VI Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>Tmin</sub> RF Output Power, P <sub>Tmin</sub>	OC .	-1 10 175 1.75 53.59468 12.2	_°C _VDC _mA _W DC _GHz _dBm		Table IIIB 10.0 ± 0.2 V Table IIIB Pdiss max Table IIIB 12 to 17 dB	
Frequency and RF Output F Measurement at 9.5 VDC or Temperature Input Voltage iput Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>			Ref. Test Para :  C VDC MA GHz dBm	5.2.5.2	Table IIIB 9.5 VDC or Table IIIB Table IIIB 12 to 17 dB	Para 5.2.3.2
Measurement at 10.5 VDC of Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Calculate Frequency Variation	on, $\Delta f_V = f_{meas}$ -	VDC  10.5  174  53.59459  12.2  f <sub>Tmin</sub> :	_°C _VDC _mA _GHz _dBm		Table IIIB 10.5 VDC of Table IIIB Table IIIB 12 to 17 dB	or Para 5.2.3.3 m
$\Delta f_V$ at 9.5 VDC or at	VDC	=	_ 0.09	MHz MHz MHz		
Calculate RF Output Power $\Delta P_V$ at 9.5 VDC or at $\Delta P_V$ at 10.5 VDC or at $\Delta P_T$ at 10.0 VDC (= $P_{Tmin}$ - $P_T$	VDC =	=	-6.4	dB dB dB		
est Performed by Litton Q.A.	Accep	Date Date	6_4-98 JUN 15 1998			
CODE IDENT NO. 56348	SIZE   A	NUMBER 1300823	RE B	i	SHEET 40	OF 68

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

## TEST DATA SHEET 7.5 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET U/A FINAL DATA SET

	INITIAL DATA S	et <u>u/a</u> final da	ATA SET	
LITTON TYPE LS <u>E</u> SERIAL NUMBER:	903 C AG/A 85032	QUAL TEST N/A		1336610- <u>5</u> PT TEST
Temperature Testing at	T=30°C, Ref. Test	Para. 5.2.5.3		
SPECIFICATION		MEASUREMENT AT	$T=30^{\circ}\pm1^{\circ}C$	LIMIT
Measurement at Vop=1	0 VDC			
Temperature		36℃		$30^{\circ} \pm 1^{\circ}C$
Input Voltage		16 VDC		$10.0 \pm 0.2 \text{ VDC}$
Input Current				Table IIIB
Input Power, P <sub>diss</sub>		1/7.7 W DC		Pdiss max
Frequency, $f_{30^{\circ}C}$		53,59636 GHz		Table IIIB
		<u></u>		12 to 17 dBm
RF Output Power, P <sub>30°C</sub>		12.8 dBm		12 to 17 dbiii
		With Voltage, Ref. Test 1	Para 5.2.5.3	
Measurement at 9.5 VD	OC or at 9.5			
Temperature		<u>3o</u> °C		Table IIIB
Input Voltage		9.5VDC		9.5 VDC or Para. 5.2.3.2
nput Current		175mA		Table IIIB
r requency, f <sub>meas</sub>		53.59637 GHz		Table IIIB
RF Output Power, P <sub>meas</sub>	•	<u> </u>		12 to 17 dBm
i inca	•			
Measurement at 10.5 V	DC or at 10.5	VDC		
Temperature		30℃		Table IIIB
Input Voltage		10.5VDC		10.5 VDC or Para. 5.2.3.3
Input Current		176mA		Table IIIB
Frequency, f <sub>meas</sub>		53.59638 GHz		Table IIIB
RF Output Power, Pmea	s <u> </u>	<u>12.8</u> dBm		12 to 17 dBm
Calculate Frequency V	ariation. $\Delta f_V = f_{max}$	- f <sub>30°C</sub> :		
$\Delta f_v$ at 9.5 VDC or at			MHz	
$\Delta f_V$ at 10.5 VDC or at	<del></del>	0.02	MHz	
$\Delta f_T$ at 10.0 VDC (= $f_{30\%}$		= -0.05	MHz	
21 at 10.0 1 2 0 ( 130-)	C *inom/			
Calculate RF Output Pe	ower Variation, ΔP	$_{\rm V}$ = $\rm P_{\rm meas}$ - $\rm P_{30^{\circ}\rm C}$ :		
$\Delta P_V$ at 9.5 VDC or at			dB	
$\Delta P_V$ at 10.5 VDC or at	<del></del>	C =	dB	•
$\Delta P_T$ at 10.0 VDC (= $P_{30}$		= 0.2	dB	
21   at 10.0 \ D C \ 136	rc · inom/			
		•	Rejec	t
Test Performed by	045	Date <u>6-4</u>		
Litton Q.A.	(50)	Date JUN 1	D 1930	
		) T D (DCD   1	DEV	CHEET II OF (0
CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

# TEST DATA SHEET 7.6 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_ FINAL DATA SET \_\_\_\_\_

LITTON TYPE LSE 903C AG/A SERIAL NUMBER: 85032	QUAL TEST N/A	AESD 1336610- 5 ACCEPT TEST
Temperature Extreme Testing at Tmax, Ref	Test Para. 5.2.5.4	
SPECIFICATION	MEASUREMENT AT Tmax	±1°C LIMIT
Measurement at Vop=10 VDC Temperature	<b>⊬</b> ∮∘C	Table IIIB
Input Voltage Input Current	VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Power, P <sub>diss</sub>		Table IIIB Pdiss max
Frequency, f <sub>Tmax</sub>	53.59694 GHz	Table IIIB
RF Output Power, P <sub>Tmax</sub>	12.9 dBm	12 to 17 dBm
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at 9.5 VTemperature		.2.5.4 Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para 5.2.3.2
Input Current	177 mA	Table IIIB
`requency, f <sub>meas</sub> `RF Output Power, P <sub>meas</sub>	<u>53.596.94</u> GHz 12.9 dBm	Table IIIB 12 to 17 dBm
	VDC <u>44</u> °C <u>10.5</u> VDC <u>178</u> mA <u>53.59694</u> GHz <u>12.9</u> dBm	Table IIIB 10.5 VDC or Para 5.2.3.3 Table IIIB Table IIIB 12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = f_{meas} - \Delta f_V$ at 9.5 VDC or at $9.5$ VDC = $2 \times 10.5$ VDC = $2 $	MHz	<u>.</u>
Calculate RF Output Power Variation, $\Delta P_V = \Delta P_V$ at 9.5 VDC or at $9.5$ VDC = $\Delta P_V$ at 10.5 VDC or at $9.5$ VDC = $4.5$ VDC = $4.5$ AP <sub>T</sub> at 10.0 VDC (= $4.5$ P <sub>Tmax</sub> -P <sub>Tnom</sub> )	dB dB	
Test Performed by .itton Q.A.	Date 6-4-98 Date JUN 1 5 1993	<del>-</del> -
CODE IDENT NO. SIZE 56348 A	NUMBER   RE <sup>3</sup> 1300823   B3	

### TEST DATA SHEET 7.7 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NA FINAL DATA SET

LITTON TYPE LS E 903 C AG/A	AESD AESD AESD AESD AESD AESD AESD AESD	1336610- 5
Power Supply Immunity, Ref. Test Para, 5.2.4	TEST N/A ACCEPT TEST	
SPECIFICATION	MEASUREMENT AT Tnom ±1°	C LIMIT
Initial Measurement Temperature Input Voltage Input Current Input Power Frequency ( $f_{Tnom}$ ) RF Output Power Frequency Setting Accuracy, $\Delta f_S$ (= $f_{Tnom}$ - $F_o$ ) Performance After Short Circuit on Power Supply:	22 °C	Table IIIB 10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm
Input Voltage Input Current Input Power Frequency RF Output Power	10	10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm
Over Voltage: Ref Test Para 5.2.4.3  Overvoltage Input Voltage  Performance After Input Overvoltage	28vdc	÷28V
Input Voltage Input Current Input Power Frequency RF Output Power	10 VDC   MA   1.77 W DC   53. 59650 GHz   12.5 dBm	10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm
Reverse Polarity: Ref Test Para 5.2.4.4  Reverse Input Voltage		$-10.0 \pm 0.2 \text{ VDC}$
Pest Performed by Litton Q.A.	O VDC   177 mA   1.77 W DC   53.54650 GHz   12.5 dBm   0.56 MHz   Reject   Date   6-4-48   Date   JUN 15 1958	10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm
CODE IDENT NO. SIZE   56348 A   LITTON / SOLID STATE DIV	1300823	REV   SHEET 43 OF 68 B3   SANTA CLARA CA 05054

### TEST DATA SHEET 7.22A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

II VI I II I	L DATA SE	1N/A 1111	AL DAIA	JEI	
LITTON TYPE LS E 90	36 A G/A			AESD 1336610-	5
SERIAL NUMBER: 8	5632	QUAL TEST	N/A	_ ACCEPT TEST _	
Frequency and Power Hystere	sis: Ref Test	Para. 5.8			
TEST DESCRIPTION				LIMITS	
1. Initial Performa	ance at Tnom	± 1°C			
Temperature Frequency, $f_{Tnom}$ RF Output Power, $P_{Tnom}$ Input Voltage, $V_B$ Input Current, $I_B$ Frequency Setting Accuracy, $\Delta f_S (= f_{Tnom} - F_0)$	22 53.59652 12.5 10 177 0.52	_°C L GHz _ dBm _ VDC _ mA _ MHz		Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $10 \pm 0.2$ VDC Table IIIB	
	Tnom ± 1°C	after +60°C soak.			٠
Temperature  equency, f <sub>meas</sub> Output Power, P <sub>meas</sub> Input Voltage  Input Current	22 53.59558 12.6 10 177	°C GHz dBm VDC mA		Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $V_B \pm .005$ VDC Table IIIB	
3. Performance at	Tnom ± 1°C	after -30°C soak.			
Temperature Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current	22 53.59654 12.5 TO	•		Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $V_B \pm .005$ VDC Table IIIB	
Calculate frequency variation, $\Delta f_H$ after 60°C soak = $\Delta f_H$ after -30°C soak =	$\Delta f_{H} = f_{\text{meas}}$ -	f <sub>Tnom</sub> : - 0.94 MI - 0.02 MI			
Calculate RF output power va $\Delta P_H = \text{after } 60^{\circ}\text{C soak} = \Delta P_H = \text{after } -30^{\circ}\text{C soak} = 0$	riation, ΔP <sub>H</sub> =	P <sub>meas</sub> - P <sub>Tnom</sub> :  O.1 dB			
st Performed by	VN	D.		Reject - 4 - 98 JUN 1 5 1998	
CODE IDENT NO. 56348	SIZE   A	NUMBER 1300823	:	EV   SHEET 58 OF 68	8

#### LITTON

#### Solid State

## TEST DATA SHEET 7.23A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

INIT	TAL DATA SET N/A FINAL D	DATA SET		
	7036 A <i>G/A</i> 35032 QUAL TEST <u>N/</u>	AESD 1336610- 5 ACCEPT TEST		
Frequency Pulling and Loa	d VSWR 2.5:1 max. all phases. Ref Tes	st Para. 5.9		
TEST DESCRIPTION		LIMITS		
Initial Measurement. Ref To Temperature Frequency RF Output Power Input Voltage Input Current	est Par. 5.9.1  °C  53.59570 GHz  dBm VDC T77 mA	24°C ± 5°C Table IIIB 12 to 17 dBm 10 ± 0.2 VDC Table IIIB		
Reference test. Ref. Test Pa	та. 5.9.3			
Frequency, f <sub>Ref</sub> RF Output Power, P <sub>Ref</sub>	<u>53.59570</u> GHz 13.25 dBm	Table IIIB		
Load Pulling Test. Ref. Tes	t Para. 5.9.4			
Maximum Frequency, f <sub>meas</sub> Minimum Frequency, f <sub>meas</sub> Maximum RF Output Powe Minimum RF Output Powe	53.59 5 69 GHz er P <sub>meas</sub>	Table IIIB Table IIIB		
Calculate maximum positive $\Delta f_L = f_{meas} - f_{Ref}$	The $(f_{meas}$ is greater than $f_{Ref}$ ) and negative $-$	$(f_{meas}$ is less than $f_{Ref}$ ) frequency variation.		
Maximum Positive $\Delta f_L =$ Maximum Negative $\Delta f_L =$	<u> </u>			
Calculate maximum positive ( $P_{meas}$ is greater than $P_{Ref}$ ) and negative ( $P_{meas}$ is less than $P_{Ref}$ ) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$ .				
Maximum Positive $\Delta P_L = \frac{+0.45}{\text{dB}} \text{dB}$ Maximum Negative $\Delta P_L = \frac{-0.35}{\text{dB}} \text{dB}$				
	Accept Reject	<del></del>		
est Performed by	Date Date			
CODE IDENT NO. 56348	SIZE NUMBER A 1300823	REV   SHEET 60 OF 68 B3		

### TEST DATA SHEET 7.23B FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

	NI DI NI DI NI	_ THATE DATA SE	·
LITTON TYPE LS <b>E</b> SERIAL NUMBER:	9036 AG/A 85032 QUAL TI	est <u> </u>	AESD 1336610- 5 ACCEPT TEST
Frequency Pulling and	l Load VSWR 2.5:1 max. all pha	ises. Ref Test Para. 5.9	9
TEST DESCRIPTION	1	L	<u>IMITS</u>
Output Open and Shor	rt. Ref. Test Para. 5.9.5		
	21 °C 53.59573 GHz 12.9 dBm 10 VDC 177 mA Acceptable requency Accuracy (both positive st-case Δf <sub>S</sub> from 7.2, 7.7, and 7.22	Ta 12 10 Ta e No e and negative),	F°C ± 5°C  able IIIB  2 to 17 dBm  0 ± 0.2 VDC  able IIIB  o Damage or Degradation
$Maximum \Delta f_{acc} =$	O.59MHz (Po:O.95MHz (Ne	sitive) Ta	while IIIB while IIIB
	hort-term Frequency Stability (bo e worst-case $\Delta f_V$ and $\Delta f_T$ from 7.		ve),
Maximum $\Delta f_{V+T} =$	O.55 MHz (Pos 1.82 MHz (Ne	•	ble IIIB ble IIIB
Calculate maximum of $\Delta P_{OV} = \Delta P_V + \Delta P_T (U)$	verall RF Output Power Stability se worst-case $\Delta P_V$ and $\Delta P_T$ from	(both positive and neg 7.2 thru 7.6) + $\Delta P_H$ (fr	gative), rom 7.22A) + $\Delta P_L$ (from 7.23A):
Maximum $\Delta P_{OV} =$	0.85dB (Positi 0.75dB (Nega	ive) 1.0	0 dB 0 dB
	Accept	_ Reject	
Test Performed by	D34	Date <u>6-4-</u>	98
iton Q.A.	(NOLL)	Date JUN 1 5	<del>1998</del>
CODE IDENT NO.	SIZE NUME	i	SHEET 61 OF 68
56348	A 13008		
LITION / S	OLID STATE DIVISION / 3251	LOLCO EL ST/SANT	IA CLARA, CA 95054

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			-
			-

**Channel 6 LO** 

DRO (P/N: 1336610-6, S/N: 85027)

			_
			man <sup>a</sup>

# TEST DATA SHEET 7.2 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET // FINAL DATA SET //

		•			
LITTON TYPE LSE 90				D 1336610	
SERIAL NUMBER:	75027	QUAL TEST NA	ACC	EPI IESI	<del></del>
Basic Electrical Test; Ref. Tes	st Para. 5.2.2				
SPECIFICATION		MEASUREMENT AT	Tnom ±1°C	LIMIT	
Measurement at Vop=10 VDC					
Temperature		°C		Table IIIB	
Input Voltage				$10.0 \pm 0.2 \text{ VDC}$	
Input Current		/ <i>&amp;&amp;</i> mA		Table IIIB	
Input Power, Pdiss				P <sub>diss</sub> max	
Frequency, f <sub>Tnom</sub>		54.40004 GHz		Table IIIB	
RF Output Power, P <sub>Tnom</sub>		/Z.od <b>Bm</b>		12 to 17 dBm	
Frequency Setting Accuracy,		<u> </u>			
$\Delta f_{S} (= f_{Tnom} - F_{o})$					
Frequency and RF Output Pov		<del></del>	5.2.3		
Measurement at 9.5 VDC or a	t <u> </u>				
Temperature		°C		Table IIIB	
Input Voltage		9.5 VDC		9.5 VDC or Para. 5.2	3.2
Input Current		186_ mA		Table IIIB	
Frequency, f <sub>meas</sub>		54.40004 GHz		Table IIIB	
RF Output Power, Pmeas		/2.odBm		12 to 17 dBm	
Measurement at 10.5 VDC or	at <u>/0.5</u>				
Temperature		<u>2</u> ℃		Table IIIB	
Input Voltage		/o.sVDC		10.5 VDC or Para. 5.2	2.3.3
Input Current		<u>/8%</u> mA		Table IIIB	
Frequency, f <sub>meas</sub>		5 <u>4. 40005</u> GHz		Table IIIB	
RF Output Power, Pmeas		<u>/2.0</u> dBm		12 to 17 dBm	
Calculate Frequency Variation	$, \Delta f_V = f_{\text{meas}} -$	$f_{Tnom}$ ,			
$\Delta f_{\rm V}$ at 9.5 VDC or at $9.5$		OC =	_MHz		
$\Delta f_V$ at 10.5 VDC or at $\frac{10.5}{5}$	_ VI	OC = 0.01	_MHz		
Calculate RF Output Power Va	ariation, $\Delta P_V$	$= P_{\text{meas}} - P_{\text{Tnom}},$		•	
$\Delta P_{\rm V}$ at 9.5 VDC or at $9.5$	_ ve	OC =	_d <b>B</b>		
$\Delta P_V$ at 10.5 VDC or at $\sqrt{6.5}$	VE	)C =	_dB		
	•	Accept Reject	<del></del>		
To a Darfamad be	Sec.	Date 6- 16-98	<b>c</b> -		
Test Performed by Litton QA	91.0	Date JUN 3 0 1998			
CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68	
CODE IDENT NO.	Δ	1300823	B3		

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

# TEST DATA SHEET 7.3 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET FINAL DATA SET

LITTON TYPE LS E 9036 AH	/A_	AESD 1336610- 6
SERIAL NUMBER: 85つ2フ	QUAL TEST V/A	ACCEPT TEST
Temperature Testing at T=10°C, Re	ef. Test Para. 5.2.5.1	
SPECIFICATION	MEASUREMENT AT T=10° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	<u></u> °C	10° ± 1°C
Input Voltage	/ <i>D</i> VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	/ <i>88</i> mA	Table IIIB
Input Power, P <sub>diss</sub>	/ · 8 8 W DC	Pdiss max
Frequency, f <sub>10°C</sub>	54. 39946 GHz	Table IIIB
RF Output Power, P <sub>10°C</sub>		12 to 17 dBm
Frequency and RF Output Power Va	ariation With Voltage, Ref. Test Para 5	.2.5.1
Measurement at 9.5 VDC or at 9	. <u>5</u> VDC	Table IIID
Temperature	°C	Table IIIB
Input Voltage	<u> </u>	9.5 VDC or Para. 5.2.3.2
Input Current		Table IIIB
Frequency, f <sub>meas</sub>	54.39945 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at/	o.s_VDC	~ 11 IIID
Temperature	°C	Table IIIB
Input Voltage	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	/8GmA	Table IIIB
Frequency, f <sub>mess</sub>	54.39944 GHz	Table IIIB
RF Output Power, Pmeas	d <b>B</b> m	12 to 17 dBm
Calculate Frequency Variation, Δf <sub>V</sub>	$=f_{\text{meas}}-f_{10^{\circ}\text{C}}$	
$\Delta f_V$ at 9.5 VDC or at $9.5$	$VDC = \frac{-0.07}{MHz}$	
$\Delta f_{\rm V}$ at 10.5 VDC or at $(0.5)$	VDC =	
$\Delta f_T$ at 10.0 VDC (= $f_{10^{\circ}C}$ - $f_{Tnom}$ )	= <u>58</u> MHz	
Calculate RF Output Power Variation	on, $\Delta P_V = P_{\text{meas}} - P_{10^{\circ}\text{C}}$ :	
$\Delta P_{V}$ at 9.5 VDC or at $9.5$	$VDC = \frac{\Theta}{\Box} dB$	
$\Delta P_{\rm V}$ at 10.5 VDC or at	$VDC = \underline{\qquad \qquad} dB$	
$\Delta P_T$ at 10.0 VDC (= $P_{10^{\circ}C}$ - $P_{Tnom}$ )	= <u> </u>	
	Accept	Reject
Test Performed by S3	Date 6-16-98	
Litton Q.A.	Date JUN 2 0 1208	
(רענוסא)		
CODE IDENT NO.	E NUMBER RI	EV SHEET 39 OF 68
56348 A		33

## TEST DATA SHEET 7.4 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_ FINAL DATA SET \_\_\_\_\_

INIT	TAL DATA SET	N/A	FINAL DATA	SET_	
LITTON TYPE LS E 92 SERIAL NUMBER:	85027	QUAL TEST	~/A		D 1336610- 6 EPT TEST /
Temperature Extreme Testi	ng at Tmin, Ref	f. Test Para. 5.2	2.5.2	_	
SPECIFICATION		MEASUREM	ENT AT Tmi	n±l℃	LIMIT
Measurement at Vop=10 V Temperature Input Voltage Input Current Input Power, P <sub>diss</sub>	DC	-1 10 187 1.87	_°C _VDC _mA _W DC		Table IIIB 10.0 ± 0.2 VDC Table IIIB Pdiss max
Frequency, f <sub>Tmin</sub> RF Output Power, P <sub>Tmin</sub>		54.39877 	_GHz _dBm		Table IIIB 12 to 17 dBm
Frequency and RF Output ! Measurement at 9.5 VDC o Temperature Input Voltage Input Current		DC -/ -/	_°C _VDC _mA	5.2.5.2	Table IIIB 9.5 VDC or Para 5.2.3.2 Table IIIB
Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>		54.39874 12.0	<del></del>		Table IIIB 12 to 17 dBm
Measurement at 10.5 VDC of Temperature Input Voltage Input Current	or at <u>/0.5</u> \	/DC / 	_°C _VDC _mA		Table IIIB 10.5 VDC or Para 5.2.3.3 Table IIIB
Frequency, f <sub>mess</sub> RF Output Power, P <sub>mess</sub>		54.39876 12.0	_GHz _dBm		Table IIIB 12 to 17 dBm
Calculate Frequency Variation $\Delta f_V$ at 9.5 VDC or at $9.5$ VDC or at $9.5$ $\Delta f_V$ at 10.5 VDC or at $9.5$ $\Delta f_T$ at 10.0 VDC (= $f_{Tmin}$ - $f_{Tn}$	VDC = VDC =	=	-0.01 -0.01 -1.27	MHz MHz MHz	
Calculate RF Output Power $\Delta P_V$ at 9.5 VDC or at $\underline{-9.5}$ $\Delta P_V$ at 10.5 VDC or at $\underline{-6.5}$ $\Delta P_T$ at 10.0 VDC (= $P_{Tmin}$ - $P_T$	VDC =	:	<del>\$</del>	_dB _dB _dB	
Test Performed by Litton Q.A.	Accep	Date Date	ect 6-76-78 JUN 3 0 1998	<del>-</del>	
CODE IDENT NO. 56348	A A	NUMBER 1300823	:	EV 3	SHEET 40 OF 68

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## TEST DATA SHEET 7.5 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET // FINAL DATA SET

INITIAL DATA SE	I W/A I I I I I I I	<u> </u>
LITTON TYPE LS E 9 · 36 AH /A SERIAL NUMBER: 550 27		AESD 1336610- <u>4</u> ACCEPT TEST <u>/</u>
Temperature Testing at T=30°C, Ref. Test	,,	
· · · · · · · · · · · · · · · · · · ·		
SPECIFICATION	MEASUREMENT AT T=30°	±1°C LIMIT
Measurement at Vop=10 VDC		
Temperature	<u>3o</u> ℃	30° ± 1°C
Input Voltage	<u>/o</u> VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current		Table IIIB
Input Power, P <sub>diss</sub>	. <u>/.88</u> W DC	Pdiss max
Frequency, f <sub>30°C</sub>	<u>54, 40053</u> GHz	Table IIIB
RF Output Power, P <sub>30°C</sub>	//. 9d <b>Bm</b>	12 to 17 dBm
Frequency and RF Output Power Variation	With Voltage, Ref. Test Para 5.	2.5.3
Measurement at 9.5 VDC or at 7.5	/DC	
Temperature	30°C	Table IIIB
Input Voltage	<u>9.5</u> VDC	9.5 VDC or Para. 5.2.3.2
Input Current		Table IIIB
Frequency, f <sub>mess</sub>	<u>54.40053</u> GHz	Table IIIB
RF Output Power, Pmess	//. 9 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at /0.5	VDC	
Temperature	<u>30</u> °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	/86 mA	Table IIIB
Frequency, f <sub>mess</sub>	54.400 53 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	//. 9 dBm	12 to 17 dBm
•	2	
Calculate Frequency Variation, $\Delta f_V = f_{meas}$	- I <sub>30°C</sub> :	
$\Delta f_V$ at 9.5 VDC or at $9.5$ VDC	· · · · · · · · · · · · · · · · · · ·	
Δf <sub>V</sub> at 10.5 VDC or at <u>10.5</u> VDC		
$\Delta f_T$ at 10.0 VDC (= $f_{30^{\circ}C}$ - $f_{Tnom}$ )	=	•
Calculate RF Output Power Variation, ΔP	$y = P_{\text{mess}} - P_{30^{\circ}\text{C}}$ :	
$\Delta P_{\rm V}$ at 9.5 VDC or at $\underline{9.5}$ VDC	= <u></u> dB	
$\Delta P_{\rm V}$ at 10.5 VDC or at $10.5$ VDC	= <u></u> dB	
$\Delta P_T$ at 10.0 VDC (= $P_{30^{\circ}C}$ - $P_{Tnom}$ )	= 0.2 dB	
Δi Τ at 10.0 v D ∈ ( 130°C - 110m)	-0./	
		Reject
Test Performed by	Date $6 - 7 - 98$	<del>_</del>
Litton Q.A. (LITTON)	Date JUN 3 0 1998	<del></del>
M 60 /		V SHEET 41 OF 68
CODE IDENT NO. SIZE	NUMBER RE	·
56348   A	1300823 B	
TOTAL POST IN CTATE DIS	TETON / 2251 OT COTT ST / SA	INTA CLARA, CA. 95054

## TEST DATA SHEET 7.6 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_ FINAL DATA SET \_\_\_\_\_

LITTON TYPE LS & 9036 AH /A		AESD 1336610- 6
LITTON TYPE LS <u>E 9036 AH /A</u> SERIAL NUMBER: <u>85027</u>	QUAL TEST NA	ACCEPT TEST
Temperature Extreme Testing at Tmax, Ref.	. Test Para. 5.2.5.4	
SPECIFICATION	MEASUREMENT AT Tmax	±1℃, LIMIT
Measurement at Vop=10 VDC		
Temperature	<i>44</i> °C	Table IIIB
Input Voltage	/OVDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current		Table IIIB
Input Power, P <sub>diss</sub>	/.87 W DC	Pdiss max
Frequency, f <sub>Tmax</sub>	54.40/33 GHz	Table IIIB
RF Output Power, P <sub>Tmax</sub>	//: 7 dBm	12 to 17 dBm
Rr Output rower, r <sub>Tmax</sub>	<b>us</b> m	121017 (2511
Frequency and RF Output Power Variation	With Voltage, Ref. Test Para 5.	2.5.4
Measurement at 9.5 VDC or at 9.5 V	DC	•
Temperature	<u> </u>	Table IIIB
Input Voltage	9·5 VDC	9.5 VDC or Para 5.2.3.2
Input Current	/86 mA	Table IIIB
Frequency, f <sub>mess</sub>	54. 40/3/ GHz	Table IIIB
RF Output Power, P <sub>mess</sub>	//. 7 dBm	12 to 17 dBm
1d Output 10 Wor, 1 mess		,
Measurement at 10.5 VDC or at 10.5	VDC	
Temperature	<u> </u>	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para 5.2.3.3
Input Current	/86 mA	Table IIIB
Frequency, f <sub>meas</sub>	54.40132 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	//. 7 dBm	12 to 17 dBm
Na Output 1 ower, 1 mess		
Calculate Frequency Variation, $\Delta f_V = f_{meas}$ -	f:	
$\Delta f_V$ at 9.5 VDC or at $9.5$ VDC =	` ~~ ·	
Δf <sub>V</sub> at 10.5 VDC or at /0.5 VDC =	~ <del></del>	
Δ1 V 01 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	= /.27 MHz	
$\Delta f_{T}$ at 10.0V (= $f_{Tmax}$ - $f_{Tnom}$ )		•
Calculate RF Output Power Variation, ΔP <sub>V</sub>	= P <sub>meas</sub> - P <sub>Tnom</sub> :	
$\Delta P_{V}$ at 9.5 VDC or at $9.5$ VDC =		
ΔP <sub>v</sub> at 10.5 VDC or at 10.5 VDC =	= <u>←</u> dB	
$\Delta P_T$ at 10.0 VDC (= $P_{Tmax}$ - $P_{Tnom}$ )	- 0.3 dB	
Acce	pt Reject	
	Date 6-17-98	
Test Performed by		<del></del>
Litton Q.A.	Date JUN 3 0 1399	<del>-</del>
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CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	
			0.00 1.0 1.3 1.00 1	CT ADA CA OFORA

### TEST DATA SHEET 7.7 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET A FINAL DATA SET

	INITIAL DATA	SET W/A	FINAL DATA	SET	<del>-</del>	
ITTON TYPE LS <u>E 9036</u> ERIAL NUMBER: <u>\$50</u>			_			
Power Supply Immunity, Ref. Test	Para. 5.2.4					
PECIFICATION		MEASUREMI	ENT AT Tnom:	<u> </u>	LIMIT	
nitial Measurement Temperature nput Voltage nput Current nput Power Frequency (f <sub>Tnom</sub> ) RF Output Power Frequency Setting Accuracy, Δf <sub>S</sub> (	= f <sub>Tnom</sub> -F <sub>o</sub> )	22 10 188 1.88 54.39990 12.0 04	GHz dBm		Table IIIB 10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm	
Performance After Short Circuit of	n Power Supply:	Ref Test Para 5.3	2.4.2			
Input Voltage Input Current Input Power Frequency RF Output Power		/ 0 /88 /. 88 54.39986 /2.0	<b>∕</b> GHz		10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm	
Over Voltage: Ref Test Para 5.2.4	.3					
Overvoltage Input Voltage		_ 2.8	_ VDC		+2 <b>8</b> V	
Performance After Input Overvolt	age					
Input Voltage Input Current Input Power Frequency RF Output Power		189 189 1.88 54.39989 12.0	_ VDC _ mA _ W DC <u>{</u> GHz _ dBm		10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm	
Reverse Polarity: Ref Test Para 5	.2.4.4					
Reverse Input Voltage		-/0	_ VDC		$-10.0 \pm 0.2 \text{ VDC}$	
Performance After Reverse Input	<u>Voltage</u>					
Input Voltage Input Current Input Power Frequency, $f_{Tnom}$ RF Output Power Frequency Setting Accuracy, $\Delta f_S$	(= f <sub>Tnom</sub> -F <sub>n</sub> )	10 188 1.88 54.39982 12.0 /8	_ VDC _ mA _ W DC _ GHz _ dBm _ MHz		10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm	
Test Performed by	unich:		Reject			
CODE IDENT NO. 56348	SIZE A	NUMB 13008:	1	REV B3	SHEET 43 OF 68	
			0.0000	CICANTEA	CT ADA CA 05054	

# TEST DATA SHEET 7.22A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET

INI	ΠAL DATA SE	T N/A FI	NAL DATA	SET	<u> </u>	
LITTON TYPE LS = 9 e SERIAL NUMBER:	36 AH/A	QUAL TEST _	N/A		AESD 1336610 ACCEPT TEST _	6
Frequency and Power Hyst	eresis: Ref Test	Para. 5.8				
TEST DESCRIPTION				LIMITS	3	
1. Initial Perfo	rmance at Tnom	± 1°C				
Temperature Frequency, $f_{Tnom}$ RF Output Power, $P_{Tnom}$ Input Voltage, $V_B$ Input Current, $I_B$ Frequency Setting Accurac $\Delta f_S (= f_{Tnom} - F_o)$		o_dBm _VDC _mA		Tnom ± Table II 12 to 17 10 ± 0.2 Table II	IB 'dBm 'VDC	
2. Performance	at Tnom ± 1°C	after +60°C soak				
Temperature Prequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current	22 54. 40002 12.0 10 188			Tnom $\pm$ Table II 12 to 17 $V_B \pm .00$ Table II	IB dBm 05 VDC	
3. Performance	at Tnom ± 1°C	after -30°C soak.				
Temperature Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current	22 54.39997 12.0 10 188			Thom $\pm$ Table III 12 to 17 $V_B \pm .00$ Table III	IB dBm 15 VDC	
Calculate frequency variation $\Delta f_H$ after 60°C soak = $\Delta f_H$ after -30°C soak =	on, $\Delta f_H = f_{\text{meas}} - i$	f <sub>rnom</sub> : - <u>0.02</u> M - <u>0.07</u> M				
Calculate RF output power $\Delta P_H$ = after 60°C soak = $\Delta P_H$ = after -30°C soak =	variation, $\Delta P_{H} =$	P <sub>meas</sub> - P <sub>Tnom</sub> :  -				
Cest Performed by Litton Q.A	\$3 (un		)ate <u>6-1</u>	Re 7 · 9 æ 3 0 1998	ject	
CODE IDENT NO. 56348	SIZE	NUMBER 1300823	RE B	ŗ	HEET 58 OF 68	)

CODE IDENT NO.



#### TEST DATA SHEET 7.23A FUNCTIONAL PERFORMANCE TESTS

INITIAL DA	TA SET NA	FINAL DATA S	ET
LITTON TYPE LS <u>E 9036 AA</u> SERIAL NUMBER: <u>850 2</u>	4 /A		AESD 1336610
SERIAL NUMBER: 8502	QUAL TES	ST N/A	ACCEPT TEST
Frequency Pulling and Load VSWR			5.9
TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5 Temperature Frequency RF Output Power Input Voltage Input Current	22 °C 54.39985 GH (2.0 dB) /0 VD	Iz m OC	24°C ± 5°C Table IIIB 12 to 17 dBm 10 ± 0.2 VDC Table IIIB
Reference test. Ref. Test Para. 5.9.3			
Frequency, f <sub>Ref</sub> RF Output Power, P <sub>Ref</sub>	54,39993 GHz -6.9 dBm		Table IIIB
Load Pulling Test. Ref. Test Para. 5	.9.4		
Maximum Frequency, f <sub>meas</sub> Minimum Frequency, f <sub>meas</sub> Maximum RF Output Power P <sub>meas</sub> Minimum RF Output Power, P <sub>meas</sub>	54.399 94 GHz 54.39992 GHz -6.3 dBn -7.3 dBn	z n	Table IIIB Table IIIB
Calculate maximum positive ( $f_{meas}$ i $\Delta f_L = f_{meas} - f_{Ref}$ :	s greater than f <sub>Ref</sub> ) an	nd negative (f <sub>meas</sub> i	s less than $f_{Ref}$ ) frequency variation.
Maximum Positive $\Delta f_L =$ Maximum Negative $\Delta f_L =$		Hz	
Calculate maximum positive ( $P_{meas}$ ) Variation, $\Delta P_{L} = P_{meas} - P_{Ref}$ :	is greater than $P_{Ref}$ )	and negative (P <sub>meas</sub>	is less than P <sub>Ref</sub> ) RF Output Power
Maximum Positive $\Delta P_L =$ Maximum Negative $\Delta P_L =$	0.6 dB	<b>}</b>	
	Accept	Reject	
Litton Q.A.	(LITTO:	Date	~ /8- 98 N 3 0 19 <b>98</b>

NUMBER

1300823

SIZE

SHEET 60 OF 68

REV

B3

### TEST DATA SHEET 7.23B FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET ∼ / A FINAL DATA SET ✓

INI	TIAL DATA SET N/A FINAL DAT	A SEI
LITTON TYPE LS & 9 o SERIAL NUMBER:	36 AH/A 85027 QUAL TEST N/A	AESD 1336610- CACCEPT TEST
Frequency Pulling and Loa	ad VSWR 2.5:1 max. all phases. Ref Test P.	ara. 5.9
TEST DESCRIPTION		LIMITS
Output Open and Short. Ro	ef. Test Para. 5.9.5	
Temperature Frequency: RF Output Power: Input Voltage Input Current: Results:	22 °C 54. 39989 GHz 12.0 dBm 10.0 VDC 188 mA Acceptable	24°C ± 5°C Table IIIB 12 to 17 dBm 10 ± 0.2 VDC Table IIIB No Damage or Degradation
Calculate maximum Frequ $\Delta f_{acc} = \Delta f_S$ (Use worst-car	tency Accuracy (both positive and negative), se $\Delta f_S$ from 7.2, 7.7, and 7.22A) + $\Delta f_H$ (from	$17.22A) + \Delta f_L \text{ (from 7.23A)}$ :
Maximum $\Delta f_{acc} =$	MHz (Positive)  - 0 . / Z MHz (Negative)	Table IIIB Table IIIB
Calculate maximum Short $\Delta f_{V+T} = \Delta f_V + \Delta f_T \text{ (Use we}$	-term Frequency Stability (both positive and orst-case $\Delta f_V$ and $\Delta f_T$ from 7.2 thru 7.6):	negative),
Maximum $\Delta f_{V+T} =$	MHz (Positive) — 1.29 MHz (Negative)	Table IIIB Table IIIB
Calculate maximum overa $\Delta P_{OV} = \Delta P_{V} + \Delta P_{T} \text{ (Use very other extension)}$	Il RF Output Power Stability (both positive a vorst-case $\Delta P_V$ and $\Delta P_T$ from 7.2 thru 7.6) +	and negative), $\Delta P_H$ (from 7.22A) + $\Delta P_L$ (from 7.23A):
Maximum $\Delta P_{OV} =$	dB (Positive) dB (Negative)	1.0 dB -1.0 dB
	Accept Reject	
Test Performed by	Date	6-19-98
Litton Q.A.	Date	JUN 3 0 1998
CODE IDENT NO. 56348	SIZE NUMBER A 1300823	REV SHEET 61 OF 68 B3
I ITTON / SOI	ID STATE DIVISION / 3251 OLCOTT ST	/ SANTA CLAKA, CA 93034

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Channel 7 LO

DRO (P/N: 1336610-7, S/N: 85020)

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## TEST DATA SHEET 7.2 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

					<del></del>	
LITTON TYPE LSE	9036 AJ/A			AESD	13366107	7
SERIAL NUMBER:	85020	QUAL TEST	NA	ACCE	PT TEST	~
	<u> </u>	Q0.12 1201				
Basic Electrical Test: Ref. T	est Para. 5.2.2					
SPECIFICATION		MEASUREME	NT AT Tron	$n = 1^{\circ}C$	LIMIT	Ι
Measurement at Vop=10 VI Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>Tnom</sub> RF Output Power, P <sub>Tnom</sub> Frequency Setting Accuracy $\Delta f_S$ (= $f_{Tnom}$ - $F_o$ )		189 1.89 54.93930	_°C VDC mA _W DC GHz dBm _MHz		Table IIIB 10.0 ± 0.2 VD Table IIIB P <sub>diss</sub> max Table IIIB 12 to 17 dBm	C
Frequency and RF Output Position Measurement at 9.5 VDC or Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>		22 9.5 187 54.93930	_°C VDC mA	3	Table IIIB 9.5 VDC or Pa Table IIIB Table IIIB 12 to 17 dBm	ara. 5.2.3.2
Measurement at 10.5 VDC of Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	or at <u>[0.5</u> VD0	22 [0.5 187 54.93931 12.8	_°C VDC mA GHz dBm		Table IIIB 10.5 VDC or I Table IIIB Table IIIB 12 to 17 dBm	Para. 5.2.3.3
Calculate Frequency Variati	ion. $\Delta f_V = f_{meas} - f_{Tno}$	om,				
$\Delta f_V$ at 9.5 VDC or at $Q_V$ at 10.5 VDC or at $Q_V$		_	<b>♂</b> _MF ),01_MF			
Calculate RF Output Power	Variation, $\Delta P_V = P$	meas - P <sub>Tnom</sub> ,				
$\Delta P_V$ at 9.5 VDC or at $\Delta P_V$ at 10.5 VDC or at $\Delta P_V$	VDC = 0.5 VDC =		<u>ф</u> dВ ф dВ			
	Acc	ept Re	eject	-		
Test Performed by Litton QA	VN (UTTO):	Date 6-1 Date JUN	1 2 1998			
CODE IDENT NO. 56348	SIZE	NUMBER 1300823		REV   B3	SHEET 38	OF 68

### TEST DATA SHEET 7.3 FUNCTIONAL PERFORMANCE TESTS

INI	TIAL DATA SET	N/A FIN	AL DATA SE	ET /	_
LITTON TYPE LS E SERIAL NUMBER:	9036 AJ/A 85020	QUAL TEST	N/A A	AESD 1336610- ACCEPT TEST	7
Temperature Testing at T	=10°C, Ref. Test P	ara. 5.2.5.1			
SPECIFICATION	MEAS	UREMENT AT I	=10° ±1°C	LIMIT	
Measurement at Vop=10 Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>10°C</sub> RF Output Power, P <sub>10°C</sub>	VDC	188 m 1.88 v 54.93967 C	C DC A V DC Hz Bm	$10^{\circ} \pm 1^{\circ}$ C $10.0 \pm 0.3$ Table IIII Pdiss ma Table IIII 12 to 17 c	2 VDC B x B
Frequency and RF Output Measurement at 9.5 VD0 Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	nt Power Variation V C or at <u>9.5</u> V	OC lo° 186n _54.93967C	Test Para 5.1 C DC A Hz Bm	Table III	or Para. 5.2.3.2 B B
Measurement at 10.5 VI Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>		10.5 186 54.93967	C VDC nA GHz lBm	Table III 10.5 VD Table III Table III 12 to 17	C or Para. 5.2.3.3 B B
Calculate Frequency Va $\Delta f_V$ at 9.5 VDC or at $\Delta f_V$ at 10.5 VDC or at _ $\Delta f_T$ at 10.0 VDC (= $f_{10^{\circ}C}$	9.5 VDC VDC	=	Ø MHz Ø MHz 87 MHz		
Calculate RF Output Po $\Delta P_V$ at 9.5 VDC or at $\Delta P_V$ at 10.5 VDC or at $\Delta P_T$ at 10.0 VDC (=P <sub>10</sub>	9 <u>5</u> VDC 105 VDC	=	ødB ødB ødB		
Test Performed by Litton Q.A.	V N (UTTON)	Date Date	Accept		
CODE IDENT NO. 56348	SIZE     A   SOLID STATE DIV	NUMBER 1300823 ISION / 3251 OL	B	33	39 OF 68

### TEST DATA SHEET 7.4 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NAL DATA SET

INITIAL DATA SET	FINAL DATA	SET
LITTON TYPE LSE 9036 AJ/A SERIAL NUMBER: 85020	QUAL TEST N/A	AESD 1336610- 7 ACCEPT TEST
Temperature Extreme Testing at Tmin. Res	f. Test Para. 5.2.5.2	
SPECIFICATION	MEASUREMENT AT Tmin	=1°C : LIMIT
Measurement at Vop=10 VDC Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>Tmin</sub> RF Output Power, P <sub>Tmin</sub>	-1 °C 10 VDC 187 mA 1.87 W DC 54.94001 GHz 12.8 dBm	Table IIIB 10.0 ± 0.2 VDC Table IIIB Pdiss max Table IIIB 12 to 17 dBm
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at 9.5 V Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>		Table IIIB 9.5 VDC or Para 5.2.3.2 Table IIIB Table IIIB 12 to 17 dBm
Measurement at 10.5 VDC or at 10.5  Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	VDC l °C l0.5 VDC l85 mA l2.8 dBm	Table IIIB 10.5 VDC or Para 5.2.3.3 Table IIIB Table IIIB 12 to 17 dBm
Calculate Frequency Variation. $\Delta f_V = f_{meas}$ $\Delta f_V$ at 9.5 VDC or at $9.5$ VDC $\Delta f_V$ at 10.5 VDC or at $9.5$ VDC $\Delta f_T$ at 10.0 VDC (= $f_{Tmin}$ - $f_{Tnom}$ )	= 0.02	MHz MHz MHz
Calculate RF Output Power Variation, $\Delta P_V$ $\Delta P_V$ at 9.5 VDC or at $\underline{9.5}$ VDC $\Delta P_V$ at 10.5 VDC or at $\underline{10.5}$ VDC $\Delta P_T$ at 10.0 VDC (= $P_{Tmin}$ - $P_{Tnom}$ )		dB dB dB
Test Performed by Litton Q.A.  Acce	Date S-11-98 Date 31 1 2 18	98
CODE IDENT NO. SIZE		EV   SHEET 40 OF 68

LITTON / SOLID STATE DIVISION / 3251 OF COTT ST / SANTA CLARA, CA 95054

## TEST DATA SHEET 7.5 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NAL DATA SET

INITIAL DATA SE	T D/A FINAL DATA	Y SEI
LITTON TYPE LS E 9036 AJ/A SERIAL NUMBER: 85020	QUAL TEST N/A	AESD 1336610- 7 ACCEPT TEST $\checkmark$
Temperature Testing at T=30°C, Ref. Test l	Para. 5.2.5.3	
SPECIFICATION	MEASUREMENT AT T=3	$60^{\circ} \pm 1^{\circ}C$ , LIMIT
Measurement at Vop=10 VDC	30 ℃	30° ± 1°C
Temperature	ID VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Voltage	188_ mA	Table IIIB
Input Current	1.88 W DC	Pdiss max
Input Power, P <sub>diss</sub>	54.93928 GHz	Table IIIB
Frequency, f <sub>30°C</sub>	12.8 dBm	12 to 17 dBm
RF Output Power, P <sub>30°C</sub>	12.8 (1)	12 to 17 dbii
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at9.5\	/DC	•
Temperature	<u>3</u> o _ °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	186_ mA	Table IIIB
Frequency, f <sub>meas</sub>	54.93928 GHz	Table IIIB
RF Output Power. P <sub>meas</sub>	12.8dBm	12 to 17 dBm
Measurement at 10.5 VDC or at [0.5] Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	VDC  30 °C  10.5 VDC  187 mA  54.93927 GHz  12.8 dBm	Table IIIB 10.5 VDC or Para. 5.2.3.3 Table IIIB Table IIIB 12 to 17 dBm
Calculate Frequency Variation. $\Delta f_V = f_{meas}$		
$\Delta f_V$ at 9.5 VDC or at $\underline{9.5}$ VDC $\Delta f_V$ at 10.5 VDC or at $\underline{10.5}$ VDC $\Delta f_T$ at 10.0 VDC (= $f_{30^{\circ}\text{C}}$ - $f_{T_{nom}}$ )		łz
Calculate RF Output Power Variation. $\Delta P_{\rm V}$ at 9.5 VDC or at 9.5 VDC $\Delta P_{\rm V}$ at 10.5 VDC or at 10.5 VDC $\Delta P_{\rm T}$ at 10.0 VDC (= $P_{30^{\circ}\text{C}}$ - $P_{\text{Tnom}}$ )	$= \frac{\phi}{dB}$	
Test Performed by Litton Q.A.	Accept Value Gall Care Date Date	
CODE IDENT NO. SIZE	NUMBER	REV   SHEET 41 OF 68
56348 A	1300823	B3
LITTON / SOLID STATE DIV	ISION 3251 OLCOTT ST	/ SANTA CLARA, CA 95054

### TEST DATA SHEET 7.6 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

INIT	IAL DATA SI	EI N/F FINAL DAT	A SEI	· ·	
LITTON TYPE LS E 9 SERIAL NUMBER: 8	036 AJ/A 35020	QUAL TEST N/A	AESD ACCEI	1336610 PT TEST _	7
Temperature Extreme Testin	g at Tmax. Re	f. Test Para. 5.2.5.4			
<u>SPECIFICATION</u>		MEASUREMENT AT T	$\max \pm 1^{\circ}C$	LIM	<u>UT</u>
Measurement at Vop=10 VD Temperature Input Voltage Input Current Input Power, P <sub>diss</sub> Frequency, f <sub>Tmax</sub> RF Output Power, P <sub>Tmax</sub>	C	<u>44</u> °C <u>10</u> VDC <u>i99</u> mA <u>1.89</u> W DC <u>54.93936</u> GHz <u>12.7</u> dBm		Table IIIB 10.0 ± 0.2 Table IIIB Pdiss max Table IIIB 12 to 17 dB	
Frequency and RF Output Po Measurement at 9.5 VDC or Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	ower Variation at <u>9.5</u>	With Voltage, Ref. Test Pa VDC  ——————————————————————————————————	ara 5.2.5.4	Table IIIB 9.5 VDC of Table IIIB Table IIIB 12 to 17 dE	r Para 5.2.3.2 Bm
Measurement at 10.5 VDC of Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	or at <u>10.5</u>	VDC  44 °C  10.5 VDC  188 mA  54.93934 GHz  12.7 dBm		Table IIIB 10.5 VDC Table IIIB Table IIIB 12 to 17 dB	or Para 5.2.3.3 3m
Calculate Frequency Variati $\Delta f_V$ at 9.5 VDC or at $\underline{q}$ . $\Delta f_V$ at 10.5 VDC or at $\underline{lo}$ $\Delta f_T$ at 10.0V (= $f_{Tmax}$ - $f_{Tnom}$ )	<u>5</u> VDC	$C = \frac{-0.02}{}$	ΙHz		•
Calculate RF Output Power $\Delta P_V$ at 9.5 VDC or at $\underline{}$ $\Delta P_V$ at 10.5 VDC or at $\underline{}$ $\Delta P_T$ at 10.0 VDC (= $P_{Tmax}$ -F	<u>.5                                    </u>	$C = \frac{\phi}{\phi}$ d	В		
Test Performed by	Act		<u>98</u> 2 1998		
CODE IDENT NO. 56348	SIZE A	NUMBER 1300823	REV B3	SHEET 4	2 OF 68

### TEST DATA SHEET 7.7 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NAL DATA SET

	INITIAL DATA	SEI N/A F	INAL DATA SE	1		
LITTON TYPE LS E 903	AJ/A	TEST NA	AESD	1336610	7	
SERIAL NUMBER: 850	<u>20                                    </u>	TEST N/A	ACCEPT TEST		·	
Power Supply Immunity, Ref. Test	t Para. 5.2.4					
SPECIFICATION		MEASUREMEN	NT AT Tnom ±1°	1 2	<u>.</u> .IMIT	
Initial Measurement						
Temperature		22	C	* <sub>T</sub>	able IIIB	
Input Voltage		10	VDC	1	$0.0 \pm 0.2 \text{ VDG}$	
Input Current		189 I	πA		able IIIB	
Input Power		1.89	W DC	P	diss max	
Frequency (f <sub>Tnom</sub> )		54.93956	GHz	T	able IIIB	
RF Output Power	•		dBm	ı	2 to 17 dBm	
Frequency Setting Accuracy, $\Delta f_5$ (	$= f_{T_{nom}} - F_o$	_ 0.44_1	MHz			
Performance After Short Circuit o	n Power Supply:	Ref Test Para 5.2.6	1.2			
Input Voltage		10	VDC	I	0.0 ± 0.2 VDC	•
Input Current		189	mA		Table IIIB	
Input Power		1.89	W DC	F	diss max	
Frequency		54.93956	GHz	ז	Table IIIB	
RF Output Power		12.7	dBm	1	2 to 17 dBm	
Over Voltage: Ref Test Para 5.2.4	۵.					
Overvoltage Input Voltage		28	VDC	-	-28V	
Performance After Input Overvolt	age					
Input Voltage		10	VDC	1	0.0 ± 0.2 VDC	
Input Current	_	189	mA		Table IIIB	
Input Power			W DC	F	diss max	
Frequency		54.43957	GHz	7	Table IIIB	
RF Output Power			dBm	I	2 to 17 dBm	
Reverse Polarity: Ref Test Para 5	244					
Reverse Input Voltage			VDC	-	10.0 = 0.2 VDC	
Performance After Reverse Input	Voltage					
		lo	VDC	,	10.0 : 0.3 VDC	
Input Voltage					10.0 ± 0.2 VDC Table IIIB	
Input Current		1.89	mA W DC		Pdiss max	
Input Power			GHz		Table IIIB	
Frequency, f <sub>Tnom</sub>			dBm		12 to 17 dBm	
RF Output Power	(- f = 5 )	_ 6.42	MHz		12 10 17 05111	
Frequency Setting Accuracy, $\Delta f_s$	( = (Tnom = F 3)					
	(TC)	· · · · ————	leject			
	UTTCh)		12 83			
Litton Q.A.	1150	Date	1 & Nab			
CODE IDENT NO.	SIZE	NUMBE	R I F	ŒV  S	SHEET 43 OF 68	
56348	A	1300823	!	B3		
20270	1 - 1					

### TEST DATA SHEET 7.22A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET. AVA. FINAL DATA SET.

INITI	AL DATA SET <u>N/A</u> FI	NAL DATA SET
LITTON TYPE LS = 9 SERIAL NUMBER: E	036 AJ/A 35020 QUAL TEST_	N/A ACCEPT TEST 7
Frequency and Power Hyster	resis: Ref Test Para. 5.8	
TEST DESCRIPTION		LIMITS
1. Initial Perform	nance at Tnom ± 1°C	•
Temperature Frequency, $f_{Tnom}$ RF Output Power, $P_{Tnom}$ Input Voltage, $V_B$ Input Current, $I_B$ Frequency Setting Accuracy $\Delta f_S$ (= $f_{Tnom}$ - $F_o$ )	22 °C 54.9393c GHz 12.8 dBm 10 VDC 189 mA -0.7 MHz	Tnom ± 1°C Table IIIB 12 to 17 dBm 10 ± 0.2 VDC Table IIIB
2. Performance	at Tnom ± 1°C after +60°C soal	<b>c.</b>
Temperature Trequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current  Performance	22 °C 54.93956 GHz 12.8 dBm 10 VDC 189 mA  at Tnom = 1°C after -30°C soak	Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $V_B \pm .005 VDC$ Table IIIB
Temperature Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage Input Current	22 °C 54.9394 GHz 127 dBm 10 VDC 188 mA	Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $V_B \pm .005 VDC$ Table IIIB
Calculate frequency variation $\Delta f_H$ after 60°C soak = $\Delta f_H$ after -30°C soak =	0.26	vIHz vIHz
Calculate RF output power $\Delta P_H$ = after 60°C soak = $\Delta P_H$ = after -30°C soak =		iB iB
Test Performed by	UTTON	Accept Reject  Date 6-11-98  Date JUN 1 6 1998
CODE IDENT NO. 56348	SIZE NUMBER	REV   SHEET 58 OF 68

## TEST DATA SHEET 7.23A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET NA FINAL DATA SET

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LITTON TYPE LS E 9036 ASSERIAL NUMBER: 85020	J/A QUAL TEST _	AESD 1336610- 7 ACCEPT TEST
Frequency Pulling and Load VSWR	2.5:1 max. all phases. R	tef Test Para. 5.9
TEST DESCRIPTION		LIMITS
Initial Measurement. Ref Test Par. 5 Temperature Frequency RF Output Power Input Voltage Input Current	.9.1°C	$24^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Table IIIB  12 to 17 dBm  10 ± 0.2 VDC  Table IIIB
Reference test. Ref. Test Para. 5.9.3		•
Frequency, f <sub>Ref</sub> RF Output Power, P <sub>Ref</sub>	54.939 82 GHz	Table IIIB
Load Pulling Test. Ref. Test Para. 5	.9.4	
Maximum Frequency, f <sub>meas</sub> Minimum Frequency, f <sub>meas</sub> Maximum RF Output Power P <sub>meas</sub> Minimum RF Output Power, P <sub>meas</sub>	••	Table IIIB Table IIIB
Calculate maximum positive ( $f_{meas}$ is $\Delta f_L = f_{meas} - f_{Ref}$ :	is greater than $f_{Ref}$ ) and ne	egative ( $f_{meas}$ is less than $f_{Ref}$ ) frequency variation.
Maximum Positive $\Delta f_L =$ Maximum Negative $\Delta f_L =$	O MHz	
Calculate maximum positive ( $P_{meas}$ ) Variation. $\Delta P_L = P_{meas} - P_{Ref}$ :	is greater than $P_{Ref}$ ) and $I$	negative (P <sub>meas</sub> is less than P <sub>Ref</sub> ) RF Output Power
Maximum Positive $\Delta P_L =$ Maximum Negative $\Delta P_L =$	o.cdB o.3dB	
	Accept Rej	ject
Test Performed by Litton Q.A.	NO 1/1	Date
CODE IDENT NO.         SIZ           56348         A	NUMBER 1300823	B3
. LITTON / SOLID STA	TE DIVISION / 3231 OF	COTT ST / SANTA CLARA, CA. 95054

# TEST DATA SHEET 7.23B

INITI		ONAL PERFORMANC  NA FINAL D.		<u> </u>
LITTON TYPE LS E 96 SERIAL NUMBER: E	036 AJ/A 05020	QUAL TEST N/A		AESD 1336610- 7 ACCEPT TEST
Frequency Pulling and Load	VSWR 2.5:1 m	ax. all phases. Ref Test	t Para. 5.9	
TEST DESCRIPTION			LIMI	<u>CS</u>
Output Open and Short. Ref.	Test Para. 5.9.5	5		
Temperature Frequency: RF Output Power: Input Voltage Input Current: Results:	54. 93982 18.9 10	°C GHz dBm VDC mA Acceptable	l0±0 Table	IIIB 17 dBm 1.2 VDC
Calculate maximum Frequent $\Delta f_{acc} = \Delta f_S$ (Use worst-case	acy Accuracy (be $\Delta f_s$ from 7.2, 7.	oth positive and negativ .7, and 7.22A) + $\Delta f_H$ (fr	ve), om 7.22A) +	Δf <sub>L</sub> (from 7.23A):
Maximum $\Delta f_{acc} =$	0.27	_ MHz (Positive) _MHz (Negative)	Table Table	
Calculate maximum Short-te $\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use wors			and negative).	
Maximum $\Delta f_{V+T} =$		_ MHz (Positive) _ MHz (Negative)	Table Table	
Calculate maximum overall $\Delta P_{OV} = \Delta P_{V} + \Delta P_{T} \text{ (Use wo}$	RF Output Powerst-case $\Delta P_V$ and	er Stability (both position of $\Delta P_T$ from 7.2 thru 7.6)	ve and negativ ) + ΔP <sub>H</sub> (from	ve). 7.22A) $\pm \Delta P_{1}$ (from 7.23A):
Maximum $\Delta P_{OV} =$	0.6 _0.5	_ dB (Positive) _ dB (Negative)	1.0 dE -1.0 d	
	Acce	pt Reject		
Test Performed by	1204 -	Date	6-11-98	
Litton Q.A.		Date	JUN 167	
CODE IDENT NO.	SIZE	NUMBER 1300823	REV B3	SHEET 61 OF 68

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56348	A	1300823	B3		
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Channel 8 LO

DRO (P/N: 1336610-8, S/N: 85078)

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## TEST DATA SHEET 7.2 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET ~/A FINAL DATA SET ~/

	<del>- 7 -</del>	<del></del>
LITTON TYPE LS E 9036AK	<u>/A</u>	AESD 1336610
SERIAL NUMBER:856 78	QUAL TEST $\sim$ /A	ACCEPT TEST
Basic Electrical Test; Ref. Test Para. 5.2	2.2	
SPECIFICATION	MEASUREMENT AT Trion	n ±1°C LIMIT
Measurement at Vop=10 VDC		
Temperature	<u></u> °C	Table IIIB
Input Voltage	VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	<i> 81</i> mA	Table IIIB
Input Power, P <sub>diss</sub>	/. F / W DC	P <sub>diss</sub> max
Frequency, f <sub>Tnom</sub>	55. 50042 GHz	Table IIIB
RF Output Power, P <sub>Tnom</sub>	13.3dBm	12 to 17 dBm
Frequency Setting Accuracy,	1.42 MHz	
$\Delta f_{S} (= f_{Tnom} - F_{o})$		
Frequency and RF Output Power Variati	ion With Voltage, Ref. Test Para 5.2.1	3
Measurement at 9.5 VDC or at		
Temperature	2 <u>z</u> °C	Table IIIB
Input Voltage	<u> </u>	9.5 VDC or Para. 5.2.3.2
nput Current	<u>179</u> mA	Table IIIB
Frequency, f <sub>meas</sub>	55.50042 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	<u>13.3</u> dBm	12 to 17 dBm
Measurement at 10.5 VDC or at		
Temperature	<u></u> •C	Table IIIB
Input Voltage		10.5 VDC or Para. 5.2.3.3
Input Current	<u>179</u> mA	Table IIIB
Frequency, f <sub>meas</sub>	55.50141 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>		12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = f_{med}$	eas - f <sub>Tnom</sub> ,	
$\Delta f_V$ at 9.5 VDC or at $9.5$	VDC = MH	<b>z</b>
$\Delta f_V$ at 10.5 VDC or at $\sqrt{6.5}$	VDC =	z
Calculate RF Output Power Variation, Δ	$P_{V} = P_{\text{meas}} - P_{\text{Tnom}},$	
$\Delta P_{\rm V}$ at 9.5 VDC or at $9.5$	VDC =dB	
	$VDC = \underline{\hspace{1cm}} dB$	
<u> </u>	Accept Reject	_
Tank Danfarma J L.	Data / - 10 0 0	
Test Performed by	Date 4 - 19.98  Date JUN 3 0 1998	
Litton QA	Date	
M EO	<u> </u>	
CODE IDENT NO. SIZE	l l	REV   SHEET 38 OF 68
56348 A	1300823	B3
LITTON / SOLID STATE	DIVISION / 3251 OLCOTT ST /	SANTA CLARA, CA 95054

## TEST DATA SHEET 7.3 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET ~/A FINAL DATA SET \_\_\_\_\_

INITI	AL DATA SET	V/A PINAL DA	TIA SET	<del></del>
LITTON TYPE LS£ 903	GAK/A	/	AESD 133661	
SERIAL NUMBER:	35078	QUAL TEST NA	_ ACCEPT TES	ST
Temperature Testing at T=1	0°C, Ref. Test Pa	ara. 5.2.5.1		
SPECIFICATION	<u>MEASI</u>	JREMENT AT T=10° ±	-1°C LIMII	-
Measurement at Vop=10 VI	OC			
Temperature		°C	10° ±	
Input Voltage		<u> </u>		0.2 VDC
Input Current		<u>/80</u> mA	Table	
Input Power, P <sub>diss</sub>			Pdiss	
Frequency, f <sub>10°C</sub>	<u> </u>	55. 50046 GHz	Table	
RF Output Power, P <sub>10°C</sub>		13.3dBm	12 to 1	17 dBm
Frequency and RF Output P	ower Variation V	With Voltage, Ref. Test	Para 5.2.5.1	9.
Measurement at 9.5 VDC or	r at <u>9.5</u> VI	OC ~	•	
Temperature		°C	Table	
Input Voltage		<u>9.5</u> VDC		OC or Para. 5.2.3.2
Input Current		<u> </u>	· Table	
Frequency, f <sub>meas</sub>	5	55.50045_GHz	Table	
RF Output Power, P <sub>meas</sub>		/3.3 dBm	12 to	17 dBm
Measurement at 10.5 VDC	orat 10.5 V	TDC		
Temperature		°C	Table	IIIB
Input Voltage		10.5 VDC	10.5 V	DC or Para. 5.2.3.3
Input Current		<u>/ 7 8</u> mA	Table	IIIB
Frequency, f <sub>meas</sub>		55.50 0 45 GHz	Table	IIIB
RF Output Power, P <sub>meas</sub>		/3.3 dBm	12 to	17 dBm
-		•		
Calculate Frequency Variat		10°C: - 0.01	MHz	
$\Delta f_V$ at 9.5 VDC or at $\underline{9.5}$			MHz	
$\Delta f_V$ at 10.5 VDC or at $\frac{10.5}{10.5}$			MHz	
$\Delta f_T$ at 10.0 VDC (= $f_{10^{\circ}C}$ - $f_T$ )	nom) =	+ 0.04	1 <b>411.17</b>	•
Calculate RF Output Power		= P <sub>meas</sub> - P <sub>10°C:</sub> :		
$\Delta P_V$ at 9.5 VDC or at $\underline{7}$ .	<u> </u>		dB	
$\Delta P_V$ at 10.5 VDC or at <u>10</u> .	ر VDC =		dB	
$\Delta P_T$ at 10.0 VDC (= $P_{10^{\circ}C}$ -F	Tnom) =		dB	
	• 4	Accept	Reject	
Test Performed by	\$3	Date 6-19		
· · · · · · · · · · · · · · · · · · ·		Date JUN 3		
Litton Q.A.	<del>(LITC*</del> )			
CODE IDENT NO.	Size	NUMBER	REV SHEE	ET 39 OF 68
56348	A	1300823	В3	
LITTON / SOL		SION / 3251 OLCOTT	ST / SANTA CLAR	A, CA 95054

### 

INITIAL	DAIAS	EI N/A F	INAL I	JATA SET _		
LITTON TYPE LSE 9036 SERIAL NUMBER: 850	,	QUAL TEST _	N/A		D 1336610 EPT TEST	8
Temperature Extreme Testing at	Tmin, I	Ref. Test Para. 5.2.5	5.2			
SPECIFICATION		MEASUREME	NT A	∏Tmin ±1°C	LIM	II
Measurement at Vop=10 VDC						
Temperature		1	°C		Table IIIB	
Input Voltage		10	VDC		$10.0 \pm 0.2 \text{ V}$	DC .
Input Current			mA		Table IIIB	
Input Power, P <sub>diss</sub>		1.79	W DC		Pdiss max	
Frequency, f <sub>Tmin</sub>		55.50030	GHz		Table IIIB	
RF Output Power, P <sub>Tmin</sub>		13.3	dBm		12 to 17 dB:	m
Id Output I Ower, I Tmin			uDiii		12 to 17 db	
Frequency and RF Output Powe Measurement at 9.5 VDC or at			Ref. Tes	t Para 5.2.5.2		
Temperature	, ,	-1	°C		Table IIIB	
Input Voltage		9.5	VDC			Para 5.2.3.2
Input Voltage Input Current		176	mA	•	Table IIIB	1 414 5.2.5.2
<u>-</u>					Table IIIB	
Frequency, f <sub>meas</sub>		55.5027				
RF Output Power, P <sub>meas</sub>			шарш		12 to 17 dB <sub>1</sub>	11
Measurement at 10.5 VDC or at	10.5	VDC				
Temperature			°C		Table IIIB	
Input Voltage		10.5	VDC		10.5 VDC o	r Para 5.2.3.3
Input Current		177	mA		Table IIIB	
Frequency, f <sub>meas</sub>		55.50026			Table IIIB	
RF Output Power, P <sub>meas</sub>		13.3			12 to 17 dB:	n
ra output rower, r meas						<del></del>
Calculate Frequency Variation,	$\Delta f_V = f_{me}$	as - f <sub>Tmin</sub> :				
$\Delta f_{\rm V}$ at 9.5 VDC or at $9.5$		C =	-0	.03 MHz		
$\Delta f_{\rm V}$ at 10.5 VDC or at $f_{\rm O}$ .	VD	C =		o4 MHz		
$\Delta f_T$ at 10.0 VDC (= $f_{Tmin}$ - $f_{Tnom}$ )		•		/2 MHz		
		•		<del></del>		
Calculate RF Output Power Vari	iation, ΔI	$P_V = P_{meas} - P_{Tmin}$ :				
ΔP <sub>v</sub> at 9.5 VDC or at 9.5		C =	~	<del>&gt;−</del> dB		
$\Delta P_{\rm V}$ at 10.5 VDC or at $\ell$ . 5		C =	7	dB		
$\Delta P_T$ at 10.0 VDC (= $P_{Tmin}$ - $P_{Tnom}$ )		=		₫B		
I at 10:0 v D C ( 1 Imin 1 Inom)		•				
	Ac	cept Reje	ect			
Test Performed by		Date	6-1	9-98		
Litton Q.A.	$\sum$	Date	JUN 3 (	1998		
(U	TONT	) W W (DED		DEX	OHEET 40	OF 69
1 \	129	NUMBER		REV	SHEET 40	Or 08
56348	A	1300823		B3		

## TEST DATA SHEET 7.5 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET // FINAL DATA SET //

INITIAL DATA SE	INAL DATA	
LITTON TYPE LS <u>E 9036 AK /A</u> SERIAL NUMBER: <u>850 78</u>	QUAL TEST N/A	AESD 1336610- 8 ACCEPT TEST
Temperature Testing at T=30°C, Ref. Test I	Para. 5.2.5.3	
SPECIFICATION	MEASUREMENT AT T=3	0° ±1°C LIMIT
Measurement at Vop=10 VDC		202 - 105
Temperature	<b>3</b> o°C	$30^{\circ} \pm 1^{\circ}C$
Input Voltage	VDC VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current	/82mA	Table IIIB
Input Power, P <sub>diss</sub>		Pdiss max
Frequency, f <sub>30°C</sub>	55. 50050 GHz	Table IIIB
RF Output Power, P <sub>30°C</sub>		12 to 17 dBm
Frequency and RF Output Power Variation Measurement at 9.5 VDC or at 7.5 V	DC	5.2.5.3  Table IIIB
Temperature	°C 9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Voltage		Table IIIB
Input Current		Table IIIB
Frequency, f <sub>meas</sub>	55.500 48 GHz	12 to 17 dBm
RF Output Power, P <sub>meas</sub>		12 to 17 dBm
Measurement at 10.5 VDC or at 10.5  Temperature Input Voltage Input Current Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub>	VDC °C VDC	Table IIIB 10.5 VDC or Para. 5.2.3.3 Table IIIB Table IIIB 12 to 17 dBm
Calculate Frequency Variation, $\Delta f_V = f_{meas}$ $\Delta f_V$ at 9.5 VDC or at $9.5$ VDC $\Delta f_V$ at 10.5 VDC or at $9.5$ VDC $\Delta f_T$ at 10.0 VDC (= $f_{30^{\circ}\text{C}}$ - $f_{Tnom}$ )	= <u>-0.02</u> MH	z
Calculate RF Output Power Variation, $\Delta P_V$ $\Delta P_V$ at 9.5 VDC or at VDC $\Delta P_V$ at 10.5 VDC or at VDC $\Delta P_T$ at 10.0 VDC (= $P_{30^{\circ}\text{C}}$ - $P_{Tnom}$ )	$=$ $\underline{\qquad}$ $dB$	
Test Performed by Litton Q.A.	Accept	9 <i>8</i> 1998
CODE IDENT NO.	NUMBER	REV SHEET 41 OF 68
56348 A	1300823	B3
LITTON / SOLID STATE DIV	ISION / 3251 OLCOTT ST /	SANTA CLARA, CA 95054

## TEST DATA SHEET 7.6 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET // FINAL PROPERTY // FINAL PROPERT

INITIAL D	ATA SET ~/A FINAL DATA	SET
LITTON TYPE LS E 9 036 A	K/A	AESD 1336610- 8
SERIAL NUMBER: 850つ	QUAL TEST N/A	ACCEPT TEST
Temperature Extreme Testing at Tr	nax, Ref. Test Para. 5.2.5.4	
SPECIFICATION	MEASUREMENT AT Tma	ux ±1°C LIMIT
Measurement at Vop=10 VDC		
Temperature	<u></u> ℃	Table IIIB
Input Voltage	/	$10.0 \pm 0.2 \text{ VDC}$
Input Current	/82mA	Table IIIB
Input Power, P <sub>diss</sub>		Pdiss max
Frequency, f <sub>Tmax</sub>	55.50035 GHz	Table IIIB
RF Output Power, P <sub>Tmax</sub>	/3./ dBm	12 to 17 dBm
Measurement at 9.5 VDC or at		
Temperature	<u>44</u> °C	Table IIIB
Input Voltage		9.5 VDC or Para 5.2.3.2
Input Current		Table IIIB
requency, f <sub>meas</sub>	55.50034 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at		
Temperature	<u></u> #4 °C	Table IIIB
Input Voltage		10.5 VDC or Para 5.2.3.3
Input Current	<i>181</i> mA	Table IIIB
Frequency, f <sub>meas</sub>	55.50032 GHz	Table IIIB
RF Output Power, P <sub>meas</sub>	<i>/3 · /</i> dBm	12 to 17 dBm
Calculate Frequency Variation, Δf <sub>V</sub>	$= f_{meas} - f_{Tmax}$ :	
$\Delta f_{\rm V}$ at 9.5 VDC or at $9.5$	VDC = -0.0/MHz	
$\Delta f_{\rm V}$ at 10.5 VDC or at 10.5	VDC = -0.03 MHz	
$\Delta f_T$ at 10.0V (= $f_{Tmax}$ - $f_{Tnom}$ )	= <u>-0.07</u> MH:	Z
Calculate RF Output Power Variation	on, $\Delta P_V = P_{mess} - P_{Tnom}$ :	
$\Delta P_{V}$ at 9.5 VDC or at $9.5$	VDC = dB	
$\Delta P_V$ at 10.5 VDC or at $10.5$	VDC = dB	
$\Delta P_{T}$ at 10.0 VDC (= $P_{Tmax}$ - $P_{Tnom}$ )	= <u>- 0.2</u> dB	
	Accept Reject	
Test Performed by Litton Q.A.	Date 6-19-9	- 9 <del>0-</del> 

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

### TEST DATA SHEET 7.7 FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET N/A FINAL DATA SET

LITTON TYPE LS E 9036 AK/A	AESD 13:	36610-8
	L TEST NA ACCEPT TEST	
Power Supply Immunity, Ref. Test Para, 5.2.4		
SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Initial Measurement		
Temperature	°C	Table IIIB
Input Voltage	VDC	$10.0 \pm 0.2 \text{ VDC}$
Input Current		Table IIIB
Input Power		Pdiss max
Frequency (f <sub>Tnom</sub> )	55.50064 GHz	Table IIIB
RF Output Power	<u> 13.2</u> dBm	12 to 17 dBm
Frequency Setting Accuracy, $\Delta f_S = f_{Tnom} - F_o$	. 64 MHz	
Performance After Short Circuit on Power Supply	: Ref Test Para 5.2.4.2	
Input Voltage		10.0 ± 0.2 VDC
Input Current	/82mA	Table IIIB
Input Power		Pdiss max
Frequency	55.500 62 GHz	Table IIIB
RF Output Power	<u> </u>	12 to 17 dBm
Over Voltage: Ref Test Para 5.2.4.3	•	
Overvoltage Input Voltage		+28V
Performance After Input Overvoltage		
Input Voltage		10.0 ± 0.2 VDC
Input Current		Table IIIB
Input Power	/ W DC	Pdiss max
Frequency	55.50058 GHz	Table IIIB
RF Output Power	<u>13.3</u> dBm	12 to 17 dBm
Reverse Polarity: Ref Test Para 5.2.4.4		
Reverse Input Voltage	-/o	$-10.0 \pm 0.2 \text{ VDC}$
Performance After Reverse Input Voltage		
Input Voltage	/O VDC	10.0 ± 0.2 VDC
Input Current	/ <i>8</i> / mA	Table IIIB
Input Power	1.8/ WDC	Pdiss max
Frequency, f <sub>Troom</sub>	55.500\$5 GHz	Table IIIB
RF Output Power	/3·3 dBm	12 to 17 dBm
Frequency Setting Accuracy, $\Delta f_S = f_{Tnom} - F_o$	•55 MHz	
	Accept Reject	
Test Performed by	Date 6-19-98	
Litton Q.A.	Date JUN 3 0 1998	
CODE IDENT NO. SIZE	NUMBER RE	
56348 A	1300823 B3	
LITTON / SOLID STATE DI	VISION / 3251 OLCOTT ST / SA	NTA CLARA, CA 95054

## TEST DATA SHEET 7.22A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_ FINAL DATA SET \_\_\_\_\_

<del></del>	
LITTON TYPE LS E 9036 AK/A SERIAL NUMBER: 85078 QUAL TEST N/A	AESD 1336610- 8 ACCEPT TEST
Frequency and Power Hysteresis: Ref Test Para. 5.8	
TEST DESCRIPTION	LIMITS
1. Initial Performance at Tnom ± 1°C	
Temperature $22$ °C  Frequency, $f_{Tnom}$ $55.50DG7$ GHz  RF Output Power, $P_{Tnom}$ $13.1$ dBm  Input Voltage, $V_B$ $10$ VDC  Input Current, $I_B$ $182$ mA  Frequency Setting Accuracy, $183$ MHz $\Delta f_S (= f_{Tnom} - F_o)$	Tnom ± 1°C Table IIIB 12 to 17 dBm 10 ± 0.2 VDC Table IIIB
2. Performance at Tnom ± 1°C after +60°C soak.	
Temperature         22         °C           requency, f <sub>meas</sub> 5549801         GHz           AF Output Power, P <sub>meas</sub> 13.2         dBm           Input Voltage         10         VDC           Input Current         184         mA	Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $V_B \pm .005$ VDC Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.	
Temperature  Frequency, f <sub>meas</sub> RF Output Power, P <sub>meas</sub> Input Voltage  Input Current  Z 2 °C  GHz  GHz  VDC  mA	Tnom $\pm$ 1°C Table IIIB 12 to 17 dBm $V_B \pm .005$ VDC Table IIIB
Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$ : $\Delta f_H$ after 60°C soak = $\frac{-0.89}{MHz}$ MHz $\Delta f_H$ after -30°C soak = $\frac{-0.01}{MHz}$	
Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$ : $\Delta P_H = \text{after } 60^{\circ}\text{C soak} =                                   $	
(CSt I critified by	Reject 24 - 98 JUN 3 0 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	Α	1300823	<b>B</b> 3	

## TEST DATA SHEET 7.23A FUNCTIONAL PERFORMANCE TESTS INITIAL DATA SET \_\_\_\_\_\_ FINAL DATA SET \_\_\_\_\_

LITTON TYPE LS = 90	36 AF/	n			AESD 1336610- 8	
	20078	*** OITAT 7	TEST N/x	1	ACCEPT TEST	<u>د</u>
SERIAL NUMBER: $8$	30 /4	QUAL I	EST <u>10 / F</u>	3	ACCEPT TEST	
Frequency Pulling and Load	VSWR 2.5:	l max. all ph	ases. Ref Tes	t Para. 5.9		
TEST DESCRIPTION				LIMI	<u>IS</u>	
Initial Measurement. Ref Te	st Par. 5.9.1					
Temperature			°C	24°C :	± 5°C	
Frequency	_ 5:		GHz	Table	IIIB	
RF Output Power		<u> 13. 2                                    </u>	iBm .	12 to	17 d <b>Bm</b>	
Input Voltage		10.0	VDC	$10 \pm 0$	0.2 VDC	
Input Current		182	mA	Table	IIIB	
Reference test. Ref. Test Par	a. 5.9.3		u.e.		•	
Frequency, f <sub>Ref</sub>	£	5500 <b>0</b> 7 G	Hz	Table	IIIR	
<u> </u>			Bm	14010	1112	
RF Output Power, P <sub>Ref</sub>		· 1 u	DIII	•		
Load Pulling Test. Ref. Test	Para. 5.9.4					
Maximum Engguenay f	6	5 <i>5</i> 1008 G	Hz	Table	IIIR	
Maximum Frequency, f <sub>meas</sub>						
Minimum Frequency, f <sub>meas</sub>		<del></del>	Hz	Table	ШБ	
Maximum RF Output Power			Bm			
Minimum RF Output Power	, P <sub>meas</sub>	-2.1d	Bm		•	
Calculate maximum positive $\Delta f_L = f_{meas} - f_{Ref}$ :	e (f <sub>meas</sub> is grea	ater than f <sub>Ref</sub>	) and negative	(f <sub>meas</sub> is less t	han f <sub>Ref</sub> ) frequency variation,	
Maximum Positive $\Delta f_L =$		6.01	MHz			
Maximum Negative $\Delta f_L =$		-0.01	MHz			
_	e (P <sub>meas</sub> is gre	-		e (P <sub>meas</sub> is less	s than P <sub>Ref</sub> ) RF Output Power	
Maximum Positive $\Delta P_L =$ Maximum Negative $\Delta P_L =$	·		dB dB			
	Ž.	,				
	Ac	ccept	Reject			
Test Performed by	JED	ri m	Date	6-27-9	8	
1 est 1 citornica by	<u> </u>					
		MOTTLY	Date	JUN 3 0 19	90	
Litton Q.A.		MOTH	Date	JUN 3 0 19	<u> </u>	
	SIZE		Date //BER	JUN 3 0 19	SHEET 60 OF 68	

### LITTON Solid State

### **TEST DATA SHEET 7.23B** FUNCTIONAL PERFORMANCE TESTS

		SET <u>NIA</u> FINAL I		<u>/</u>
LITTON TYPE LS E SERIAL NUMBER:		QUAL TESTN	Α	AESD 1336610- 8 ACCEPT TEST
Frequency Pulling and	l Load VSWR 2.5	:1 max. all phases. Ref Te	est Para. 5.9	•
TEST DESCRIPTION	1		LIMI	TS
Output Open and Shor	rt. Ref. Test Para.	5.9.5		
Temperature Frequency: RF Output Power: Input Voltage Input Current: Results:	22 55500 13.3 10.0	C ☐ GHz ☐ dBm VDC ☐ mA Acceptable	Table 12 to 10 ± ( Table	17 dBm 0.2 VDC
	• •	y (both positive and negating 2, 7.7, and 7.22A) + $\Delta f_H$ (f	,, ·	$\Delta f_L$ (from 7.23A):
Maximum $\Delta f_{acc} =$	9.68 - 0.10		Table Table	
	-	acy Stability (both positive and $\Delta f_T$ from 7.2 thru 7.6):		
Maximum $\Delta f_{V+T} =$	0.12	MHz (Positive) MHz (Negative)	Table Table	
	-	Power Stability (both position $\Delta P_T$ from 7.2 thru 7.6	_	ve), .7.22A) + ΔP <sub>L</sub> (from 7.23A):
Maximum $\Delta P_{OV} =$	<u> </u>	dB (Positive) dB (Negative)	1.0 dE -1.0 d	
		ccept Reject		
Test Performed by	Jen	Date	6-27-98	,
Litton Q.A.		Date	JUN 3 0	1998
CODE IDENT NO.	SIZE	NUMBER	REV D2	SHEET 61 OF 68

			-

**Channels 9-14 LOs** 

PLO No. 1 (P/N: 1348360-1, S/N: F09)

PLO No. 2 (P/N: 1348360-1, S/N: F10)

			1 mayori
1			

#### Summary of Test Results for AMSU-A Phase Locked Oscillator Testing Serial Numbers F09 and F10

Paragraph	Description	Paguiromento	E00	
3.2.1.1		Requirements	F09	F10
3.2.1.1	Input Voltage and Current	600 mA max, +15V	522 mA for	533 mA for
	Current	100 mA max, -15V	+15V, 64 mA	+15V, 70 mA
3.2.1.2	10	100. 400	for -15V	for -15V
3.2.1.2	Operating Temperature	+1°C to 44°C	-24°C to	0°C to 57°C
3.2.1.3		493 1 6000	+60°C	<u> </u>
3.2.1.3	Start-up	All loads, +60°C and -	Verified at	Verified at
		30°C; in vacuum	+60 and -	+60 and -
3.2.1.4 &	Frequency Stability from	±200 kHz	30°C, ambient	30°C, ambient
3.2.1.4 &	57.290344 GHz	±200 KHZ	+0kHz, -33 kHz	+16 kHz,
3.2.1.3	37.230344 0112		-33 KHZ	-0 kHz
3.2.1.6	RF Output Power	17 to 20 dBm	18.1 dBm	17.9 dBm
3.2.1.7	Output Power Stability	<1.5 dB	1.4 dB	1.5 dB
3.2.1.8	Load VSWR	2.01:1 or less	Verified	Verified
·		3.01.1.01.000	· omico	\ Cillica
3.2.1.9	AM Noise	<-130 dBc/Hz @ 1 MHz	-145 dBc/Hz	-140 dBc/Hz
			@ 1MHz	@ 1Mhz
3.2.1.10	FM Noise	<-100 dBc/Hz @ 1 MHz	-104 dBc/Hz	-105 dBc/Hz
			@ 1 MHz	@ 1 MHz
3.2.1.11	Spurious and Sub-	<-90 dBc	<-90 dBc	<-90 dBc
	Harmonic Signals			
3.2.1.12	Harmonics	<-30 dBc	-40 dBc	- 70 dBc
22114	777	20 1		
3.2.1.14	Warm-up Time	< 30 minutes	Verified	Verified
3.2.1.15	Grounding and		By Design	By Design
3.2.1.13	Shielding		Dy Design	by Design
	- Canadanag		]	
3.2.1.16	Input Voltage Protection		By Design	By Design
				Dy Design
3.2.1.17	Reverse Polarity		By Design	By Design
	Protection		' '	,
Environmental				
Testing				
Microphonics		AE-26633	TCXO Test	TCXO Test
Radiation		AE-26633	By Analysis	By Analysis
Hardness				
EMI/RFI		AE-26633	Not Required	Not Required
Vibration		AE-26633	Acceptance	Acceptance
· <u> </u>			Level	Level
Thermal		AE-26633	Verified at	Verified at
Vacuum			Ambient	Ambient
			Pressure Only	Pressure Only
Weight		2.0 lbs	2.0 lbs	2.0 lbs

### 58C et 98

### TEST DATA SHEET 6C (Sheet 1 of 4) Functional Testing (Paragraph 4.2.1)

O Post-Thermal Cycling CPT

Test Setup Verified

ned: <u>Allusus</u> Signature

Step	aph 4.2.1.3, Functional Testing Test	Expected	Measured	Pass/ Fail
1	Potential Difference from ± 1	5 V RTN to:		
	PLO Base Plate	< 1.0 Vac	0.03 Vae	Puss
	Spectrum Analyzer	< 1.0 Vac	0.02 1/20	Pass
	Frequency Counter Chassis	< 1.0 Vac	OctVae	Pass
	Power Meter Chassis	< 1.0 Vac	0.07Vae	PRSS
4	Evacuate vacuum chamber and record pressure	<10 <sup>-2</sup> torr	Pressure =	*
5	Thermal couple readings	TC1 = 22 ± 2 °C	TC1 = 24,0 °C	Puss
	_		TC2 = <u>23.4</u> °C	N/A
			TC3 = 23.1 °C	N/A
6	DRO L/A	0 to 1V	DRO L/A = 8? m V	Pass
	PLO L/A	S/N: F06, F08 = 14.6 ± 0.4V S/N: F07 = 0 to 1V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = <u>4.53</u> V	Pa 55
	Is PLO locked?	Yes	Yes <u>4es</u> No	Puss
7	PLO Frequency	57.290344 ± .0002 GHz	Freq. = 57, 29033:410 GHz	
	PLO Power	17 to 20 dBm	P = <u>18.11</u> dBm	Pass
8	Input Voltage and Current		🙉 गनरन्ध	
	VM1 Voltage	+15 ± 0.1 V	VM1 = 115.19 V 9	Pas
	VM2 Voltage	-15 ± 0.1 V	VM2 = -15,14 V 1 2 10-11-11	Puss
	IM1 Current	600 mA max.	IM1 = mA	Pass
	IM2 Current	100 mA max.	$IM2 = \underline{-63.9} mA$	Fair
	DRO L/A Voltage	0 to 1V	DRO L/A = 86.6 mV	Pass
	PLO L/A Voltage	S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.53 V	Pass
12	RF Output Power and	20 dBm مِن 17	P = 18.(1 dBm	Pass
	Frequency	57.290344 ± .0002 GHz	Freq. = 57.296331916 GHz	Fast
	Baseplate Temp. (TC1)	TC1 = 22 ±2°C	TC1 = 23.4 °C	Pas

<sup>\*</sup>Record data only if performing test under vacuum

KHZ Jeeg

#### TEST DATA SHEET 6C (Sheet 2 of 4) Functional Testing (Paragraph 4.2.1)

Pa	nh 4 2 1 3 (Cont):	Post-Thermal Cycling CPT		
Step	ph 4.2.1.3 (Cont): Test	Expected	Measured	Pass/ Fail
13	Frequency vs. Voltage	Expected   Measured   Pass/Fail		
•	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = 15.2 V	Pass
İ	-	-15.2 ± 0.05 V		· 1/
	·	57.290344 ± .0002 GHz	•	
		17 to 20 dBm	$P = \frac{(8c)5}{dBm}$	
14	Frequency vs. Voltage			
ļ	·· ± 15 V Supplies	+14.8 ± 0.05 V		
		-14.8 ± 0.05 V	-Voltage = <u>-14. 8</u> V	
		57.290344 ± .0002 GHz	• •	
		17 to 20 dBm	$P = \underline{ig_{i}l\varrho} dBm$	
15	Spurious and Sub	-200 to -90 dBc	gee plots	V
16	Power level of 114.58 GHz signal	<-10 dBm	<u>-35.33</u> dBm	Pass
17	Load VSWR and Frequency	Pulling		
	2:1 mismatch over 1λ	N/A		N/A
	2:1 mismatch over 1λ	N/A		N/A
18	Operating Temperature	TC1 = 1 ±2°C	TC1 = 2.7°C	
	@ 1°C baseplate		TC2 = 23C	N/A
			TC3 = 1,9°C	N/A
		0 - 1V	DRO L/A = 7/1846 V	Pass
			PLO L/A = <u>4.53</u> V	Pass
19	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V		
	VM2 Voltage	-15 ± 0.1 V	VM2 = ~15.0 V	
	IM1 Current	600 mA max.	IM1 = 508 mA	
	IM2 Current	100 mA max.	$IM2 = \underline{62} mA$	
	DRO L/A Voltage	0 to 1V	DRO L/A = 71.8inV	
	PLO L/A Voltage	S/N: F06, F07, F08 = $14.6 \pm 0.4$ V S/N: F05, F09 - F14 = $4.3$ to $4.7$ V	PLO L/A = <u>4.53</u> V	
	RF Output Power	17 to 20 dBm	Power = 19,09 dBm	IV
	I KI Output I ower			

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#### TEST DATA SHEET 6C (Sheet 3 of 4) Functional Testing (Paragraph 4.2.1)

aragra	aph 4.2.1.3 (Cont):	Post-Thermal Cycling CPT		
Step	Test	Expected	Measured	Pass. Fail
19	Frequency vs. Voltage			
(Cont)	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = <u>+15.2</u> V	Pass
	_	-15.2 ± 0.05 V	-Voltage = $-15. \nu$ V	1
		57.290344 ± .0002 GHz	Freq. = 57,290324394 GHz	
		17 to 20 dBm	Power = $18.62$ dBm	
	Frequency vs. Voltage			$\neg$
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = $\frac{1/4/8}{V}$	
		-14.8 ± 0.05 V	-Voltage = $-14.8$ V	
		57.290344 ± .0002 GHz	Freq. = 57.290324236 GHz	
		17 to 20 dBm	Power = 18.62 dBm	
	Spurious and Sub	-200 to -90 dBc	See plots	
	Power level of 114.58 GHz signal	<-10 dBm	dBm	Pes,
	Load VSWR and Frequency	Pulling		
	2:1 mismatch over 1λ	N/A	Worst Case Freq = 6 kg	N/A
	2:1 mismatch over 1λ	N/A	Worst Case Power =  O(7 dB	N/A
21	Operating Temperature	TC1 = 44 ±2°C	TC1 = 44°C	fass
	@ +44°C Baseplate		TC2= 43,9°C	N/A
	•		TC3 = 43,8°C	N/A
		0 - 1V	DRO L/A = 139m V	Per.
		S/N: F06, F07, F08 = $14.6 \pm 0.4$ V S/N: F05, F09 - F14 = $4.3$ to $4.7$ V	PLO L/A = <u>4,54</u> V	
22	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = /S, O V	
	VM2 Voltage	-15 ± 0.1 V	VM2 = <u>~/5.0</u> V	
	IM1 Current	600 mA max.	$IM1 = \underline{534} mA$	
	IM2 Current	100 mA max.	IM2 = _~65 mA	
	DRO L/A Voltage	0 to 1V	DRO L/A = 140 m V	
	PLO L/A Voltage	S/N: F06, F07, F08 = $14.6 \pm 0.4$ V S/N: F05, F09 - F14 = $4.3$ to $4.7$ V	$PLOI/A = \underline{4.54} V$	
	RF Output Power and	17 to 20 dBm	Power = 17,66 dBm	Y
	Frequency	57.290344 ± .0002 GHz	Freq. = 57.250 725503 GHz	Pas

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### TEST DATA SHEET 6C (Sheet 4 of 4) Functional Testing (Paragraph 4.2.1)

-		Post-Thermal Cycling C	PT				
Paragra Step	aph 4.2.1.3 (Cont):  Test	Expected	Measured	Pass/Fai			
22	Frequency vs. Voltage						
(Cont)	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = 15.2 V	Pass			
		-15.2 ± 0.05 V	-Voltage =(5.2 V	1			
	<u>-</u>	57.290344 ± .0002 GHz	Freq. = 57.29 0325594 GHz				
		17 to 20 dBm	Power = <u>i7.36</u> dBm				
	Frequency vs. Voltage						
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = 14.8 V				
		-14.8 ± 0.05 V	-Voltage = -14.8 V				
		57.290344 ± .0002 GHz	Freq. = 570 (7.56) 9 GHz	İ			
		17 to 20 dBm	Power = 17.58 dBm	ļ			
	Spurious and Sub	-200 to -90 dBc	see plots				
	Power level of 114.58 GHz signal	<-10 dBm	dBm	Puss			
± 15 V Supplies +14.8 ± 0.05 V  -14.8 ± 0.05 V  57.290344 ± .0002 GHz  17 to 20 dBm  Spurious and Sub -200 to -90 dBc  Power level of 114.58 GHz <-10 dBm  signal  Load VSWR and Frequency Pulling  2:1 mismatch over 1λ N/A							
	2:1 mismatch over 1λ	N/A	Worst Case Freq = 7 Hz	N/A			
	2:1 mismatch over 1\(\lambda\)	N/A	Worst Case Power =	N/A			

Shop Order No.:	538596	
Operation:	0170	•

Unit Serial No.: F09

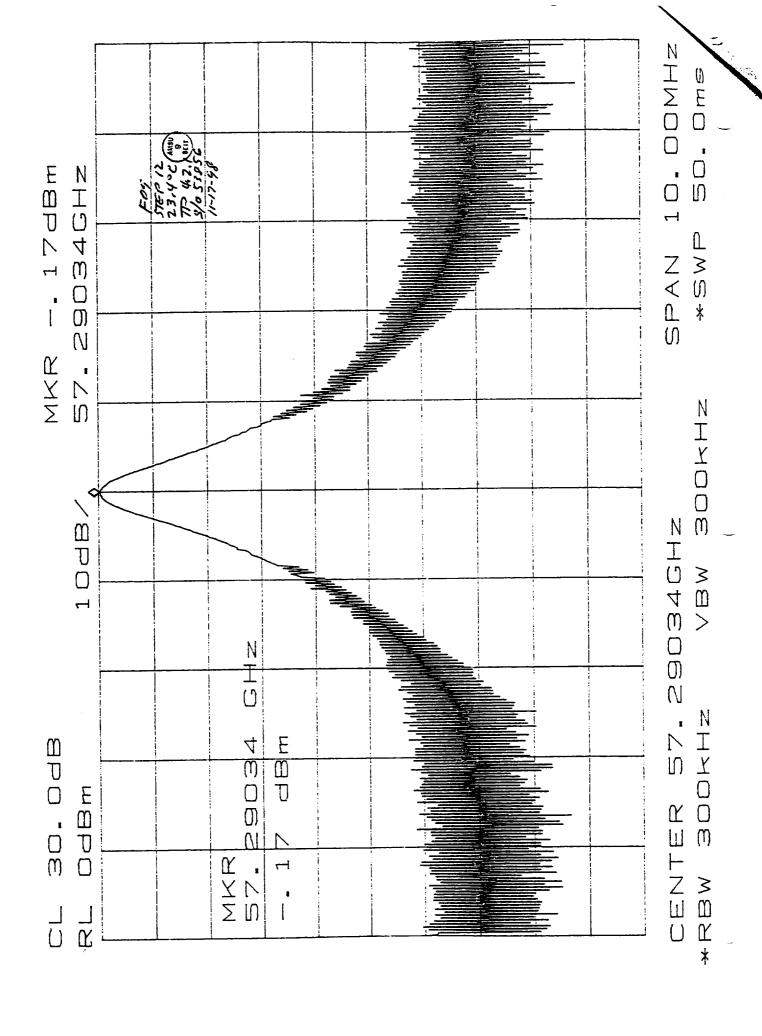
Date: 11-17-98

Test Engineer:

Quality Control:

Govt. Rep.:

| Millim Dana | 1/18/98



TEST DATA SHEET 7 (Sheet 1 of 3) Temperature Cycling (Paragraph 4.2.2)

Test Setup Verified: <u>Musual</u> (Min)

Temperature Cycle	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
Frequency 57.290344 GHz ±200 kHz	57,290327 490 GHZ	57.290328 285 GHZ	57, 290 330 856 GH3		N	
Output Power 17 to 20 dBm	17.95dBm	17.8dBm	17.59 \$3m		A	11/1
Frequency 57.290344 GHz ±200 kHz	57.290335 074 GHZ	57,290335 877 GHB	57.290338 062 GHZ			
Output Power 17 to 20 dBm	18.03dBm	18,05dBM	17,85dBu			

Beginning of cycle 3 |

arubient -> freq = 57.290330050 GHz

Po = 17.7 d Bm

ambient > Po = 17.85 d Pom

Shop Order No.: <u>53859</u> 6	Test Engineer: Muyus
	Quality Control: NOV 18 78
Unit Serial No.: F09	GOVI. Rep.: W. Din Donc 14/8/98
Date:	

#### TEST DATA SHEET 6C (Sheet 1 of 4) Functional Testing (Paragraph 4.2.1)

Post-Thermal Cycling CPT

Test Setup Verified:

Step	aph 4.2.1.3, Functional Testing Test	Expected	Measured	Pass/ Fail
1	Potential Difference from ± 1	5 V RTN to:		<del>*************************************</del>
	PLO Base Plate	< 1.0 Vac	O (DIV	Puss
	Spectrum Analyzer	< 1.0 Vac	0.624	Pass
	Frequency Counter Chassis	< 1.0 Vac	0.06V	Pass
	Power Meter Chassis	< 1.0 Vac	0.02V	Pass
4	Evacuate vacuum chamber and record pressure	<10 <sup>-2</sup> torr	Pressure =torr	*
5	Thermal couple readings	TC1 = 22 ± 2 °C	TC1 = 23.4 °C	
	·		TC2 = 24.0 °C	N/A
			TC3 = 22.9 °C	N/A
6	DRO L/A	0 to 1V	DRO L/A = 73 m V	Pass
	PLO L/A	S/N: F06, F08 = 14.6 ± 0.4V S/N: F07 = 0 to 1V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.54 V	Pass
	Is PLO locked?	Yes	Yes No	Pass
7	PLO Frequency	57.290344 ± .0002 GHz	Freq. = 57.290346129 GHz	Pas
	PLO Power	17 to 20 dBm	P = 17.5 dBm	Pess
8	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = +15.18 V	Pass
	VM2 Voltage	-15 ± 0.1 V	$VM2 = \frac{-5.20}{V}$	Pass
	IM1 Current	600 mA max.	IM1 = 533 mA	Pass
	IM2 Current	100 mA max.	$IM2 = \frac{-70.2}{mA}$	Pass
	DRO L/A Voltage	0 to 1V	DRO L/A = 73 44 V	Pass
	PLO L/A Voltage	S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = <u>4.54</u> V	Pass
12	RF Output Power and	17 to 20 dBm	P = /7.9 dBm	Pass
_	Frequency	57.290344 ± .0002 GHz	Freq. = 57.290346129 GHz	Pass
	Baseplate Temp. (TC1)	TC1 = 22 ±2°C	TC1 = 23.6 °C	Pas

<sup>\*</sup>Record data only if performing test under vacuum

### TEST DATA SHEET 6C (Sheet 2 of 4) Functional Testing (Paragraph 4.2.1)

) } }	nh 4 2 1 2 (Cont):	Post-Thermal Cycling CPT		
Step	ph 4.2.1.3 (Cont):  Test	Expected	Measured	Pass. Fai
13	Frequency vs. Voltage			
	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = $\frac{15.20}{\text{V}}$ V	Pas:
		-15.2 ± 0.05 V	-Voltage = <u>-15,22</u> V	Pas
		57.290344 ± .0002 GHz	Freq. = 57.290 346067 GHz	Pas
		17 to 20 dBm	P = 17.83  dBm	Pas
14	Frequency vs. Voltage			
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = 14.80 V	Pus
		-14.8 ± 0.05 V	-Voltage = <u>-14.80</u> V	Pus
		57.290344 ± .0002 GHz	Freq. = 57.240354969 GHz	Pas
		17 to 20 dBm	P = 17,81 dBm	Pas
15	Spurious and Sub	-200 to -90 dBc	See Plas	Puss
16	Power level of 114.58 GHz signal	<-10 dBm	_ 70; 33 dBm	Pass
17	Load VSWR and Frequency	Pulling		
	2:1 mismatch over 1λ	N/A	Worst Case Freq =	N/A
	2:1 mismatch over 1\(\lambda\)	N/A	Worst Case Power = dB Peak	N/A
18	Operating Temperature	TC1 = 1 ±2°C	TC1 = 1.700	
	@ 1°C baseplate		TC2 = 2.4°C	N/A
			TC3 = \( \( \) \( \) \( \)	N/A
		0 - 1V	DRO L/A = LOW V	Pass
		S/N: F06, F07, F08 = $14.6 \pm 0.4$ V S/N: F05, F09 - F14 = $4.3$ to $4.7$ V	PLO L/A = <u>4.55</u> V	Pis
19	Input Voltage and Current			ΤΑ-
	VM1 Voltage	+15 ± 0.1 V	VM1 = <u>+15.0</u> V	Pus
	VM2 Voltage	-15 ± 0.1 V	VM2 = ~15.0 V	Pur
	IM1 Current	600 mA max.	IM1 = 520 mA	pw
	IM2 Current	100 mA max.	IM2 =68.7 mA	pus
	DRO L/A Voltage	0 to 1V	DRO L/A = 60 m V	Pas
	PLO L/A Voltage	S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.55 V	Pas
	RF Output Power	17 to 20 dBm	Power = <u>18.75</u> dBm	Pus
	Frequency	57.290344 ± .0002 GHz	Freq. = \$7.29 c 334351 GHz	Pu

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#### TEST DATA SHEET 6C (Sheet 3 of 4) Functional Testing (Paragraph 4.2.1)

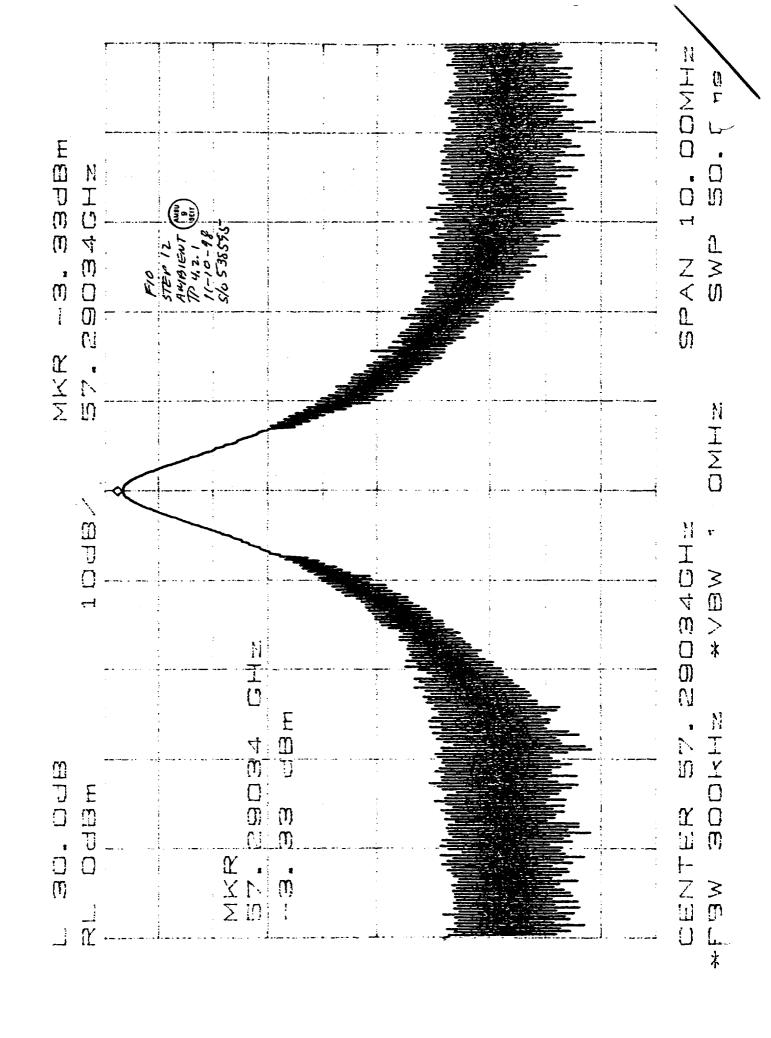
Post-Thermal Cycling CPT Paragraph 4.2.1.3 (Cont): Pass/ Expected Measured Step Fail Frequency vs. Voltage 19 +Voltage =  $\frac{4}{\sqrt{5}}$  $\sqrt{2}$  $\sqrt{2}$  $\sqrt{3}$  $\sqrt{4}$ Pass  $+15.2 \pm 0.05 \text{ V}$ (Cont) ± 15 V Supplies -Voltage = -15.23 V $-15.2 \pm 0.05 \text{ V}$ Dish Freq. = 57,296337429 GHz Pass 57.290344 ± .0002 GHz 7655 Power = 18.2 dBm 17 to 20 dBm Frequency vs. Voltage +Voltage = 414.85 V Pass . +14.8 ± 0.05 V ± 15 V Supplies -Voltage =  $\frac{-14.85}{V}$ Rass -14.8 ± 0.05 V Freq. = 57.290 33)111 GHz Pass 57.290344 ± .0002 GHz Page Power = 18..6 dBm17 to 20 dBm P & \$ \$ -200 to -90 dBc see slos Spurious and Sub dBm <-10 dBm Power level of 114.58 GHz Pass Load VSWR and Frequency Pulling N/A Worst Case Freq = N/A 2:1 mismatch over 1λ Worst Case Power = N/A N/A 2:1 mismatch over 1λ 017 dB TC1 = 43.3TC1 = 44 ±2°C Operating Temperature 21 N/A TC2 = 43.Z @ +44°C Baseplate TC3 = 42. 8 N/A DRO L/A = 110 m V Pacs 0 - 1V PLO L/A = 4.55 V S/N: F06, F07, F08 =  $14.6 \pm 0.4$ V Pers S/N: F05, F09 - F14 = 4.3 to 4.7VInput Voltage and Current 22 VM1 = +15.0 Puss  $+15 \pm 0.1 \text{ V}$ VM1 Voltage  $VM2 = \frac{-13.0}{}$ Pass VM2 Voltage -15 ± 0.1 V IM1 = 343fass 600 mA max. IM1 Current IM2 = -7/3mΑ Pass 100 mA max. IM2 Current DRO L/A = 110 m V وعماله 0 to 1V DRO L/A Voltage PLOL/A = 4.55 VS/N: F06, F07, F08 =  $14.6 \pm 0.4$ V PLO L/A Voltage S/N: F05, F09 - F14 = 4.3 to 4.7V Pass 17 to 20 dBm Power = 171 dBm RF Output Power and Freq. = 57.290341590 GHz Pass 57.290344 ± .0002 GHz Frequency

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### TEST DATA SHEET 6C (Sheet 4 of 4) Functional Testing (Paragraph 4.2.1)

		Post-Thermal Cycling C	PT		
Рагадта	aph 4.2.1.3 (Cont):			T	
Step	Test	Expected	Measured	Pass/Fail	
22	Frequency vs. Voltage				
(Cont)	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = <u>+1524</u> V	Pass	
		-15.2 ± 0.05 V	-Voltage = IS . ZL V	Pass	
	-	57.290344 ± .0002 GHz	Freq. = 57.290342419 GHz	Pass	
		17 to 20 dBm	Power =(7,1 dBm	Pass	
	Frequency vs. Voltage				
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = i4.85 V	Pass	
		-14.8 ± 0.05 V	$-Voltage = - \frac{14.84}{V}$	Pass	
		57.290344 ± .0002 GHz	Freq. = 57.793+2793 GHz	Pass	
		17 to 20 dBm	Power = [7.( dBm.	Pass	
	Spurious and Sub	-200 to -90 dBc	see plots	Pass	
	Power level of 114.58 GHz signal	<-10 dBm	<u> </u>	Pass	
	Load VSWR and Frequency Pulling				
	2:1 mismatch over 1λ	N/A	Worst Case Freq =	N/A	
	2:1 mismatch over 1λ	N/A	Worst Case Power =	N/A	

Shop Order No.: <u>538595</u>	Test Engineer:	_
Operation:	Quality Control: (1A)	RU 10 -28
Unit Serial No.: FIO	Govt. Rep.:	11/11/94
Date:		



26758C 2 Oct 98

### TEST DATA SHEET 7 (Sheet 1 of 3) Temperature Cycling (Paragraph 4.2.2)

Test Setup Verified: Musus Signature

Temperature Cycle	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
Frequency 57.290344 GHz ±200 kHz	- 57.290 338 986 GHz	57.290336 175 GHZ	57.290343 942 GH3		120	000
Output Power 17 to 20 dBm		17.8dBm	17.8dBn	.//	grant 1/5	7/8
Frequency 57.290344 GHz ±200 kHz	57.290343 <i>GH3</i>	57,290347 GHZ	57.290348 725 GH3			
Output Power 17 to 20 dBm	17.80 dbm	17.8346~	-17.9dBn			

 Shop Order No.:
 538595
 Test Engineer:
 AMULY 10 74

 Operation:
 0/70
 Quality Control:
 30
 10 74

 Unit Serial No.:
 F/O
 Govt. Rep.:
 1//1/48

 Date:
 1/-5-98

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		<b>-</b> ·

Channel 15 LO

GDO (P/N: 1336610-10, S/N: FM5)

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1			

### AMSU-A GDO Data Sheet 1

Sequence Description: Millitech Part Number Aerojet Part Number 1	9050160001 336610-10	C Comf	per <u>şm {</u>	Date: 7 Operator: QC Verify Se	/(4/97  et-up:	MTC AGA		
A. Output Power Output Power			ut Power in t	est set-up: 🏒	<i>13.75</i> dBm	1		
B. Unit Temperat		Vá	acuum level:	<i>30</i> mTorr				
C. Baseline Meas		44.05	15.75	: !::-	T man timia	D/5-11		
Vb (voits)	15.0	14.25	15.75	min limit	max limit	Pass/Fail		
Vb meas. (Volts)	115.00	+14.25	+15,75	05	+.05	6245		
ib (mA)	182	182	182		230	Pars		
fo (GHz)	89.010	89,010	59.010					
Po (dBm, meas)	+13,70	13,70	13,69	4.0	4.7			
Po (dBm, corr)	14.01	14.01	16.00	13	17	Pass		
D. Frequency Pull	ling, Vb = 15	0.0 volts; mea	sured /5.00	V				
Fref (GHz)	89.010			min limit	max limit	Pass/Fail		
Fmax (GHz)	89.012	+Δ (MHz)	+2		+ 5 MHz	fair		
Fmin (GHz)	89,008	- Δ (MHz)	- 2	-5 MHz		Pasa		
E. Power Pulling								
Pref (dBm)	-6.06			min limit	max limit	Pass/Fail		
Pmax (dBm)	-5.89	+∆ (dB)	+0.17		+0.2dB	Dass		
Pmin (dBm)	-6.23	- Δ (dB)	-0.17	-0.2 dB		Pagg		
F. Turn-on currer					<del></del>			
Vb (volts)	15.	0 min li	imit max li					
Measured Vb	1500	<u> </u>		Pus				
Turn-on current (mA)	182		345		55			
time to peak (ms)	11,2							
time to settle (ms)	11.2							
G. Unit Temperat	ure:+ <u>20:5</u> °C	C Va	acuum level:	<u> ユラ</u> mTor	r			
DATA SH	DATA SHEET ACCEPT/REJECT							
Accep	t MTC		ect					
		Test F	ailure Repoi	t No.				

SIZE	CAGE CODE	DWG. NO.	
A	8V456	TP50	1600-2
SCALE	R	EV. LTR.	SHEET
		A00	29 OF 41

Report Date

### AMSU-A GDO Data Sheet 1

Millitech Part Number 9050160001; Serial Number FMS Aerojet Part Number 1336610-10

Operator: QC Verify Set-up:



Output Power direct: 15.95 dBm; Output Power in test set-up: 13.64 dBm

Output Power Delta: 2,3 / dB

Unit Temperature: <u>+43</u> °C; Vacuum level: <u>40</u> mTorr В.

**Raseline Measurements** 

C. Daselitie Mie	830161116116		·	<del></del>		
Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	+15.00	+14.25	+15.75	05	+.05	Pars 5
Ib (mA)	190	190	190		230 .	1955
fo (GHz)	88,995	88,495	68.995			
Po (dBm, meas)	+13.34	+13,34	+13,34	See and the		
Po (dBm, corr)	+15.45	715.45	+15,45	13	17	1455

Frequency Pulling, Vb = 15.0 volts; measured 15.00 V

Fref (GHz)	88,995	SUCCESS.	100 1100	min limit	max limit	Pass/Fail
Fmax (GHz)	28.999	+Δ (MHz)	+3		+ 5 MHz	Pa 55
Fmin (GHz)	58 1992	- Δ (MHz)	- 3	-5 MHz		Pass

Power Pulling

E. FOWER Laining						
Pref (dBm)	-6,34	an sales and a second		min limit	max limit	Pass/Fail
Pmax (dBm)	-6.14	+Δ (dB)	+0.18		+0.2dB	Pa 55
Pmin (dBm)	-6.52	- Δ (dB)	-0.18	-0.2 dB	-	Pa55

Turn-on current

i dili dii dali dii				
Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	+15,00			Pass
Turn-on current (mA)	190	_	345	P445
time to peak (ms)	9,8		10,000	
time to settle (ms)	9,8		********	And 1 44 77 1

Unit Temperature: <u>+43</u> °C Vacuum level: <u>40</u> mTorr G.

DATA SHEET ACCEPT/REJECT

Accept (MTC)	Reject	
	Test Failure Report No.	
•	Report Date	

SIZE	CAGE CODE 8V456	DWG. NO. TP50160	00-2
SCALE	REV	. LTR.	SHEET
		A00	29 OF 41

### AMSU-A GDO Data Sheet 1

Sequence Description Millitech Part Number Aerojet Part Number	: <u>-2</u> C 9050160001 1336610-10	Comp ; Serial Num	iber <u>FM5</u>	Date:	/15/97 - 7/1 /057 et-up:	<b>1</b> /97
A. Output Power Output Power			put Power in	test set-up:	13. 64 dBm	1
B. Unit Temperat	ture: <u>-2</u> °C;	V	acuum level:	<u> 20</u> mTor	r	
C. Baseline Meas	urements					
Vb (voits)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	+15.00	+14,25		05	+.05	1055
lb (mA)	175	175	175		230	Pass
fo (GHz)	89.011	89,011	89.011	_	_	
Po (dBm, meas)	13.59	13.59	13.59			
Po (dBm, corr)	15,90	15.90	15.90	13	17	P=51
D. Frequency Pul	ling, Vb = 15	.0 volts; mea	asured <u>4/5,00</u>	V		
Fref (GHz)	89.011			min limit	max limit	Pass/Fail
Fmax (GHz)	89,012	+∆ (MHz)	1+1	_	+ 5 MHz	1955
Fmin (GHz)	89.010	- ∆ (MHz)	1-1	-5 MHz		Pasi
E. Power Pulling						
Pref (dBm)	-6.05		200	min limit	max limit	Pass/Fail
Pmax (dBm)	-5.87	+Δ (dB)	+0118		+0.2dB	Pasa
Pmin (dBm)	-6.21	- Δ (dB)	-0116	-0.2 dB		Pasa
F. Turn-on curren	it					
Vb (volts)	15.0	) min l	imit   max li	mit Pass	/Fail	
Measured Vb	+1510	0		Da	55	
Turn-on current (mA)	175		345	Da		
time to peak (ms)	10.0					
time to settle (ms)	10.0					
G. Unit Temperate	ure: <u>~</u> °C	Va	acuum level:	<i>20</i> mTor	r	
DATA SH	EET, ACCEPT	/REJECT				
Accep		Rej	ect			
			ailure Repor	t No.		
			Report			
		<u> </u>	порот	50.0		
					· · · - · · · · · · · · · · · · · · · ·	
			. ,	NGE CODE SV456	DWG. NO. TP50	1600-2
		1	SCALE	REV.		SHEET
					A00	29 OF 41

### AMSU-A GDO Data Calculation Sheet 8

Sequence Description: Frequency Accuracy & Stability Calculations Date: 7/29/97

Millitech Part Number 9050160001; Serial Number FM5 Operator: 057

Aerojet Part Number 1336610-10

### A. Frequency Accuracy from Thermal Vacuum, CPT and Final LPT Data

	Parameter, Vb = 15.0 volts	Data Sheet, Section	Date, mm/dd/yy	Measurement
	+Δ, pulling, +20.5°C, MHz	1, D	7/14/97	12
1	+Δ, pulling, +20.5 C, MHz	1, D	7/14/97	- 2
2	- Δ, pulling, + 20.5°C, MHz	1, D	7/2.16.7	+ 3
3	+Δ,pulling, +43°C		7/2//91	- 3
4	-Δ, pulling, +43°C	1, D		+1
5	+Δ, pulling, -2°C	1, D	7/25/91	1
<u>-</u>	-Δ, pulling, -2°C	1, D	7/25/91	7
<del>,</del> –	Set point w / max Hysteresis, GHz	6, E	717/97	89.010
_	Set point w / min Hysteresis, GHz	6, E	7/2192	\$5,990
8	Set point w/min Hystercold, 5.1.	89,	0/3	89013 GHZ
9	(Maximum of lines 1, 3, and 5) +7	EF	987	88.587GHz
10	(Maximum of lines 2, 4, and 6) +8	0 0 1	,	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

### B. Frequency Accuracy Result

	Result	min limit	max limit	Pass/Fail
AO CH2	87,013		89.030	Per55
A9, GHz	88 687	88.970		Pass
A10, GHz	88.487	00.570		

### CONTINUED, GO TO NEXT PAGE

SIZE	CAGE COD 8V456		TP501600-2		
SCALE	•	REV. LTR. AOC	36 OF 41		

### AMSU-A GDO Data Calculation Sheet 8, continued

Sequence Description: Frequency Accuracy & Stability Calculations Date: Millitech Part Number 9050160001; Serial Number FM5 Operator: USY Aerojet Part Number 1336610-10

### Frequency Stability from Comprehensive Performance Test Data C.

	Bias Voltage, volts	Data Sheet, Section	Date, mm/dd/yy	Tcase, °C	Measurement, GHz
	14.25	1, C	7/14/97	+20.5	89.010
<del></del>	15.0	1, C	2/14/97	+20.5	89,010
2_	15.75	1, C	7114/97	+20.5	89.010
3_	14.25	1, C	7/25/97	-2	89.011
4_	15.0	1, C	7/25/57	-2	89.011
5	15.75	1, C	7/15/97	-2	89.011
6	<u> </u>	1, C	7/21/97	+43	83.985
	14.25	1, C	7/21/47	+43	F\$ 495
8	15.0	1, C	2/21/97	+43	FF. 995
9_	15.75		* 1000 MHz	,	/ MHz
10	((Maximum of 1 through 9) -C2)				- 15 MHz
11	((Minimum of 1 the	ough 9) -C2)	* 1000 MH	Z	- /5 1011/2_

### Frequency Stability Result D.

	Result	min limit	max limit	Pass/Fail
C10, MHz	<i>+1</i>	-	+50	Pa155
C11, MHz	-15	-50	-	Pass

### DATA SHEET ACCEPT/REJECT

DATA SHEET ACCEPT/REJE		
Accept (Sa)	Reject	
- 1333F	Test Failure Report No.	
	Report Date	

SIZE	CAGE COD 8V456		DWG. NO. TP501600-2	2
SCALE		REV.	LTR. A00	37 OF 41

			• nyaée

REFER TO TEST DATA OF SAW FILTERS PREPARED

IN THE SECTION OF BANDPASS CHARACTERISTICS

Report No. 11413 February, 1999

FREQUENCY STABILITY OF SAW FILTERS

14	0.2	+0.049, -0.00	+0.02	+0.069, -0.00	
13	0.2	+0.00, -0.059	+0.02	+0.02, -0.059	
12	0.9	+0.189, -0.284	+0.02	+0.209, -0.284	
Ξ	6.0	+0.658, -0.543	+0.02	+0.678, -0.543	
Channel No.	Specification (+/-MHz)	Short-Term Measured (MHz)	Long-Term By Analysis (+/-MHz)	Total	

Note: Additional +/-0.1 MHz frequency stability reserved for safety margin for channels 11-14.

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### BANDPASS CHARACTERISTICS FOR IF FILTERS AND SAW FILTERS

-		

Report No. 11413 February, 1999

## 3 dB BANDWIDTH OF IF FILTERS

E E	,		Ų	,	ı			,	,
Channel No.	3	<b>+</b>	n	0	`	×	ς,	01	\$1
Specification (MHz)	06	200	0/1	200	200	165	165	78	0009
3 dB bandwidth (MHz) *	82	192	170	192	192	157	157	78	1020
f <sub>L</sub> - f <sub>H</sub> (MHz)	8-90	8-200	30-200	8-200	8-200	8-165	8-165	178-256	490-1510
Measured (MHz)									
3 dB bandwidth (MHz)	80.12	190.20	167.86	189.97	190.15	155.06	155.06	75.98	995.47
f <sub>L</sub> - f <sub>H</sub> (MHz)	8.84-	9.04-	31.40-	9.14 <b>-</b> 199.11	9.13-	9.19- 164.25	9.16- 164.22	179.34- 255.32	490.78- 1486.25

\* Actual specifications for IF filters.

		_
		_

Report No. 11413 February, 1999

# 3 dB BANDWIDTH FOR SAW FILTERS

			_					
14		9	316.2-319.2	325.2-328.2		5.905	316.274-319.223	325.256-328.212
13		91	308.2-316.2	328.2-336.2		15.676	308.247-316.070	328.234-336.087
12		32	292.2-308.2	336.2-352.2		30.904	292.551-307.988	336.297-351.764
-		72	256.2-292.2	352.2-388.2		70.189	256.937-291.835	352.592-387.883
Channel No.	Specification	3 dB Bandwidth (MHz)	f <sub>L1</sub> - f <sub>H1</sub> (MHz)	f <sub>1,2</sub> - f <sub>H2</sub> (MHz)	Measured	3 dB Bandwidth (MHz)	f <sub>L1</sub> - f <sub>H1</sub> (MHz)	f <sub>L2</sub> - f <sub>H2</sub> (MHz)

			ar
			-
1			

### **Channel 3 Bandpass Filter**

IF Filter (S/N: 1331559-3, S/N: P229-007)

			***
			***

Γ	APPE	NDIX C	ACCEPTAN	CE TEST REPOR	<u>T</u>	
		PASS FILTER MODEL HLE DJET 1331559-3 REV.		S/N <u>P2Z9-</u> 06	ד	
	ACCE	B BANDWIDTH PTANCE TEST PROCEDU 05-02 PARA 4.5.3	RE	-10°C	+15°C	+40°C
	{7} UF	PPER 3.0 dB BANDEDGE		<u>89.12</u> MHz (88.0-90.0)	<u>8გ.9</u> 6_Mhz (88.0-90.0)	<u>\$8.81</u> MHz (88.0-90.0)
	{8} LC	OWER 3.0 dB BANDEDGE		<u>8.84</u> MHz (8.0-10.0)	8.84 Mhz (8.0-10.0)	<u> 8.83</u> MHz (8.0-10.0)
	{9} 3.0	D dB RELATIVE BANDWIDT	TH .	<u>80.28</u> MHz (78.0-82.0)	<u>名0・12</u> Mhz (78.0-82.0)	7 <u>9.98 </u> MHz (78.0-82.0)
	{10} A	ADD {7} AND {8} ÷ 2 =		<u> 48.98</u> мHz (50.0 NOM)	<u>48.90</u> мHz (50.0 NOM)	<u> 4§.8Z</u> Mhz (50.0 NOM)
	{10a}	RECORD MEASURED TEN	MPERATURE		+ <u>l5.</u> 6°C (12.5 TO 17.5)	- <u>47.9 °</u> C (40.0 TO 45.0)
		ITACH TRANSMISSION LO ORMANCE X-Y PLOT	oss	<u>/</u> (1)	<u> </u>	<u>/</u> (1)
~						
	ACCE	<u>BAND RIPPLE</u> PTANCE TEST PROCEDU 05-02 PARA 4.5.4	RE	-10°C	+15°C	+40°C
	{11a}	MIN INSERTION LOSS FR	EQ	24.90MHz	24.90 Mhz	23.86 MHz
		MIN INSERTION LOSS PE	ERFORMANC	E -0.16dB	-0.17 dB	- <u>0.18</u> dB
	{11b}	75% BW LOWER BANDED	GE FREQ	10.91 MHz	10.84 Mhz	1 <u>0.79</u> MHz
		75% BW LOWER BANDER	OGE I.L. PER	F - <u>0,40</u> dB	-0.42 dB	- <u>044</u> db
	{11c}	75% BW UPPER BANDED	GE FREQ	70.9) MHz	70.84Mhz	7 <u>0.79</u> MHz
		75% BW UPPER BANDED	GE I.L. PERI	F - <u>0.39</u> dB	- <u>0.42</u> dB	- <u>0.44</u> dB
	{11d}	PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a}	<b>}</b> )	<u>0.24</u> dB	<u>0.25</u> dB	<u>O.26</u> dB
	{11e}	PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a}	)	<u>0.73</u> dB	<u>0.25</u> dB	<u>O.26</u> dB
1 -						
C	Pared in a	accordance with MIL-STD-100 CT NO.	SIZE	CAGE CODE 57032	DWG. NO. 63-0005-02	REV.

Α

DADEN-ANTHONY ASSOCIATES INC. FILE: ACAD/63/0502APCJ.DOC

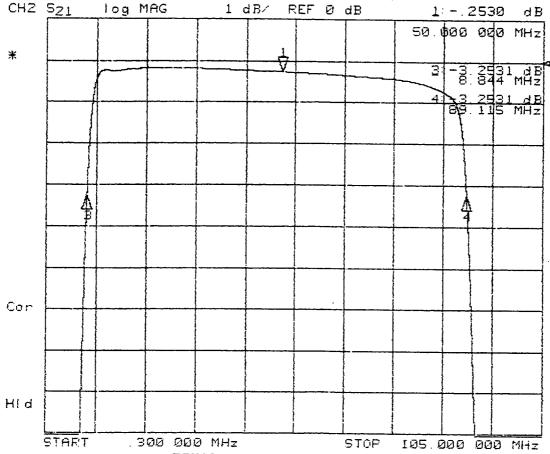
57032

63-0005-02

SHEET

J

13

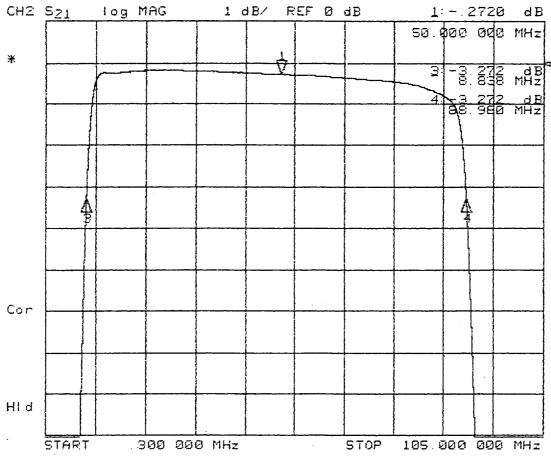


### FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P229-007

-10C DATA

MARKER PARAMETERS OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER 1       14.000000 MHz       50.000000 MHz         MARKER 2       86.000000 MHz       48.979993 MH         MARKER 3       20.000000 MHz       8.844553 MH         OFF       -3.2531 dB         MARKER 4       80.000000 MHz       89.115434 MH         OFF       -3.2531 dB         MKR STIMULUS OFFSET       0.000000 MHz       89.425802 MH         -3.2342 dB       -3.2342 dB
OFF     OFF       MARKER 3     20.000000 MHz     8.844553 MH       OFF     -3.2531 dB       MARKER 4     80.000000 MHz     89.115434 MH       OFF     -3.2531 dB       MKR STIMULUS OFFSET     0.000000 MHz     89.425802 MH
OFF -3.2531 dB  MARKER 4 80.000000 MHz 89.115434 MH OFF -3.2531 dB  MKR STIMULUS OFFSET 0.000000 MHz 89.425802 MH
0FF -3.2531 dB -3.2531 dB MKR STIMULŲS 0FFSET _ 0.000000 MHz 89.425802 MH
REFERENCE MARKER OFF OFF PLACEMENT CONTINUOUS CONTINUOUS MARKER SEARCH OFF OFF TARGET VALUE -14 dB -3 dB MARKER WIDTH VALUE -3 dB -3 dB OFF OFF MARKER TRACKING OFF OFF

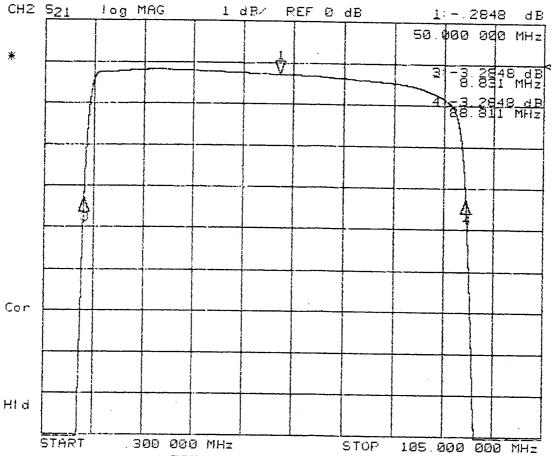


### FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P229-007

+15C DATA

OPR: R. HOGGATT DATE DEC 18 1996 MARKER PARAMETLING

MARKER 1	14.000000 MHz OFF	50.000000 MHz 2720 dB
MARKER 2	86.000000 MHz OFF	48.899670 MHz OFF
MARKER 3	20.000000 MHz OFF	8.838653 MHz -3.272 dB
MARKER 4	80.000000 MHz OFF	88.960688 MHz -3.272 dB
MKR STIMULUS OFFSET	0 4B 0.000000 MHz	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIBTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF -14 dB -3 dB OFF OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF



FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P229-007 +40C DATA

MARKER PARAMETERS OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER 1	14.000000 MHz OFF	50.000000 MHz 2848 dB
MARKER 2	85.000000 MHz OFF	48 821378 MHz OFF
MARKER 3	20.880000 MHz OFF	8.831021 MHz -3.2848 dB
MARKER 4	80.000000 MHz CFF	88.811736 MHz -3.2848 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF -14 dB -3 dB OFF OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF

### **APPENDIX C**

### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-007 AEROJET 1331559-3 REV. -

### PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL	(0.5 dB MAX)
------------------------	--------------

(PASS/FAIL

(PASS)FAIL

(11g) ATTACH PASSBAND RIPPLE

PERFORMANCE X-Y PLOT(S)

/(V)

**OUT-OF-BAND REJECTION** 

ACCEPTANCE TEST PROCEDURE

-10°C

+15°C

+40°C

63-0005-02 PARA 4.5.5 Fc=50.0 MHz.

REF (5A) FOR INSERTION LOSS @ Fc

{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz

>100 dB (40.0 dB MIN)

>100 dB (40.0 dB MIN) 7100 dB (40.0 dB MIN)

{13a} WORST CASE REJECTION FROM

102.0 MHz TO 1000.0 MHz

-58.0 dB (40.0 dB MIN) -58,9 dB (40.0 dB MIN)

-59.9 dB (40.0 dB MIN)

{13c} RECORD MEASURED TEMPERATURE

-12.8 °C (-15.0 TO -10.0) (12.5 TO 17.5)

+15.3**°**C

+43.0°C (40.0 TO 45.0)

**{14} ATTACH REJECTION PERFORMANCE** X-Y PLOT(S)

TEST PERFORMED BY

DATE

Not witnessed NOTE IF TEST WITNESSED BY AESD: \_ this time. DLD

\*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\*

### **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION**

{16} REFERENCE CUSTOMER DRAWING 1331559

**DESCRIPTION OF MEASUREMENT** 

DIMENSION AND TOLERANCE

ACTUAL

**OVER ALL LENGTH** 

 $3.50 \pm .03$ 

3.501

**MEASUREMENT** 

MOUNTING HOLE CENTER

 $0.125 \pm .010$ 

0.127

BETWEEN UPPER MOUNTING HOLES

3.250

3.251

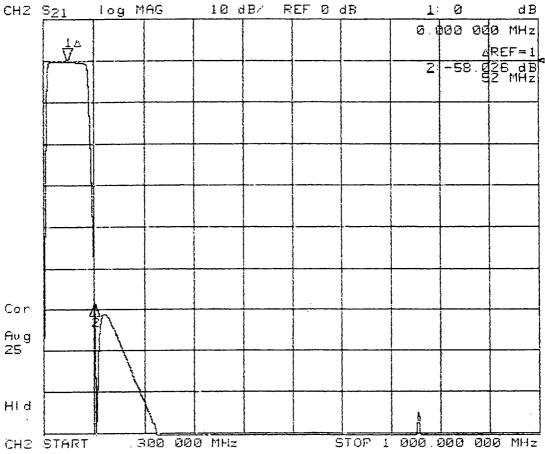
BETWEEN LOWER MOUNTING HOLES

3.250

3.254

Prepared in accordance with MIL-STD-100

CONTRACT NO.	SIZE A	CAGE CODE <b>57032</b>	DWG. NO. 63-0005-02	REV.
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APCJ.DOC	SHEET	14



### FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P229-007

OPR: R. HOGGATT DATE DEC 18 1996

-10C DATA

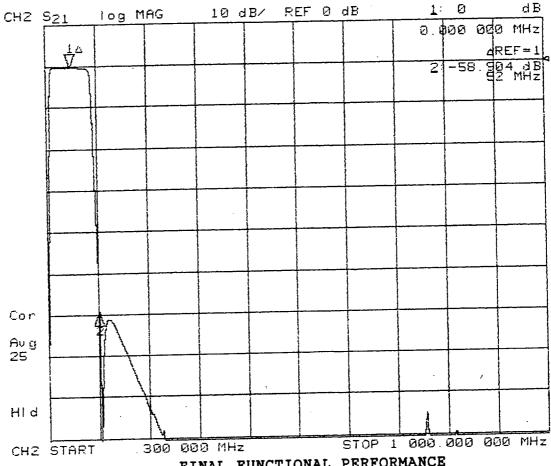
MARKER PARAMETERS	Similar 1	Tomunnet 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2		102.000000 MHz -58.026 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0 4B 0.000000 MHz	0 4B 0.00000 MHz
PLACEMENT MARKER SEARCH TARGET VALUE	OFF	MARKER 1 CONTINUOUS OFF -3 dB -3 dB

-3 dB OFF

OFF

OFF OFF

MARKER TRACKING



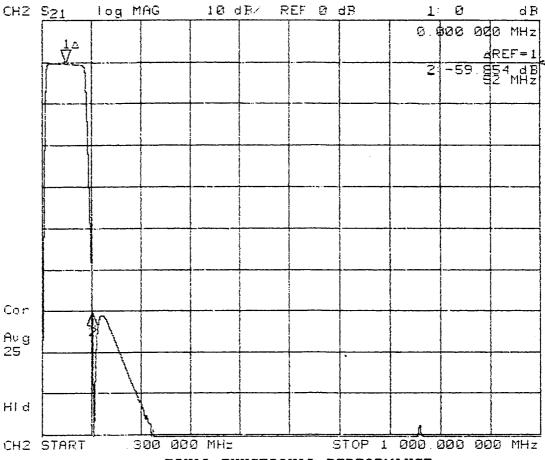
### FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P229-007

+15C DATA

MARKER TRACKING

OPR: R. HOGGATT DATE DEC 1 8 1996 Thunnel 2 MARKER PARAMETERS

MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -58.904 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5,000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0 4B 0.000000 MHz	8 9B 0'000000 WHz
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -3 dB -3 dB OFF	MARKER 1 CONTINUOUS OFF -3 dB -3 dB OFF
MARKER TRACKING	OFF	OFF



### FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P229-007

+40C DATA

	Ecochic (	OPR:	R.	HOGGATT	DATEDECTS	<b> </b>	~
MHKKER	PARAMETLING			SHORINE		ununnel	۷

MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -59.854 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF	MARKER I CONTINUOUS OFF -3 dB -3 dB OFF OFF

### **APPENDIX C**

### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL50-80-10SS1 S/N PZ29-007 AEROJET 1331559-3 REV.

### **BANDPASS CHARACTERISTICS MEASUREMENT**

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.9 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

/(1)

**{24} TEST POINT MATRIX** 

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	- <u>109.1</u> dB	F11	(*) 60.0	MHz	-0.34 dB
F2	1.0	MHz	<u>- 97.0 dB</u>	F12	(*) 70.0	MHz	-0.43 dB
F3	5.0	MHz	<u>- 30.3 dB</u>	F13	80.0	MHz	-0.61 dB
F4	7.5	MHz	<u>- 9.77 dB</u>	F14	85.0	MHz	- 0.88 dB
F5	10.0	MHz	<u>-1.30</u> dB	F15	90.0	MHz	-6.28 dB
F6	15.0	MHz	<u>-0.27</u> dB	F16	100.0	MHz	-47.5 dB
F7	20.0	MHz	<u>-0.19</u> dB	F17	200.0	MHz	-82.7 dB
F8	(*) 30.0	MHz	<u>- 0.18</u> dB	F18	300.0	MHz	-101.5 dB
F9	(*) 40.0	MHz	-0.24 dB	F19	500.0	MHz	-100.9 dB
F10	50.0	MHz	-0.27 dB	F20	1000.0	MHz	-110.2 dB

TEST PERFORMED BY: R. HOGGATT 5 DATE 12/18/46

NOTE IF TEST WITNESSED BY AESD. this time. DLD \_\_\_\_\_

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

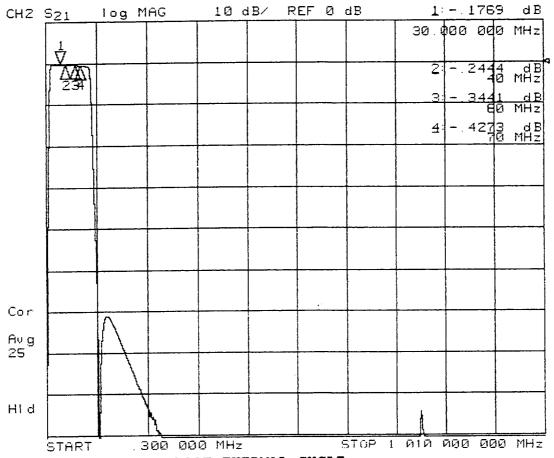
### **FUNCTIONAL PERFORMANCE TEST**

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX C PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

Prepared in accordance with MIL-STD-100				
CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.
	A	57032	63-0005-02	J
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APCJ.DOC	SHEET	11



POST THERMAL CYCLE PASSBAND CHARACTERISTICS SERIAL NO. P229-007 AMBIENT

OPR: R. HOGGATT DATE DEC 18 1996 Juunnel 2 MARKER PARAMETERS

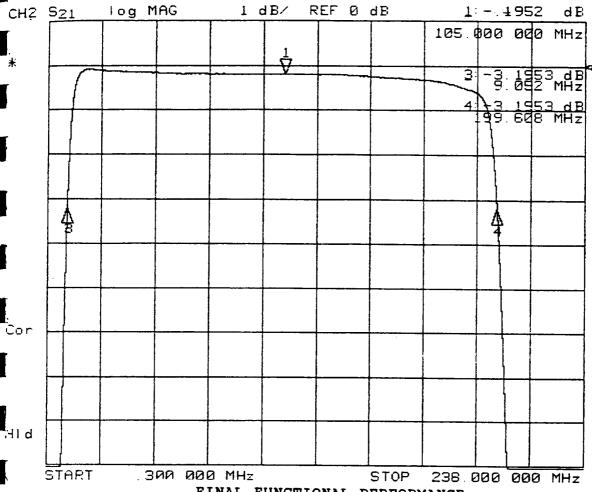
MARKER 1	30.000000 MHz OFF	30.000000 MHz 1769 dB
MARKER 2	40.000000 MHz OFF	40.000000 MH± 2444 dB
MARKER 3		60.000000 MHz 3441 dB
MARKER 4	70.000000 MHz OFF	70.000000 MHz 4273 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	-3 dB	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF
MARKER TRACKING	VI 1	VIII

### **Channel 4 Bandpass Filter**

IF Filter (S/N: 1331559-2, S/N: P228-012)

I			

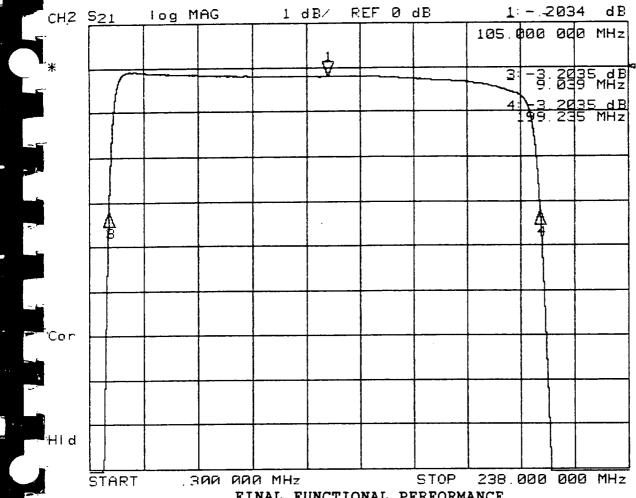
APPENDIX B AC	CEPTANCE TEST REPO	RI	
BANDPASS FILTER MODEL HL105- AEROJET 1331559-2 REV.	190-10SS1 S/N <u>PZZ8-</u> C	12	
3.0 dB BANDWIDTH ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	<u>199.6 l</u> MHz (198.0-200.0)	1 <u>99.24</u> Mhz (198.0-200.0)	1 <u>98.89</u> MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	<u>9.05</u> MHz (8.0-10.0)	9.04 Mhz (8.0-10.0)	<u>9.03</u> MHz (8.0-10.0)
(9) 3.0 dB RELATIVE BANDWIDTH	1 <u>90.56</u> MHz (188.0-192.0)	1 <u>90.20</u> Mhz (188.0-192.0)	1 <u>89.86</u> MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	1 <u>04.33 </u> MHz (105.0 NOM)	1 <u>04.14</u> MHz (105.0 NOM)	1 <u>03.9</u> CMhz (105.0 NOM)
{10a} RECORD MEASURED TEMPER	(-15.0 TO -10.0)	+ <u>15.6</u> °C (12.5 TO 17.5)	+ <u>43.4</u> °C (40.0 TO 45.0)
(6) ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	<u>√</u> (√)	<u> </u>	<u> </u>
PASSBAND RIPPLE ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	18.13 MHz	19.91 Mhz	16.94 MHz
MIN INSERTION LOSS PERFO	DRMANCE -0.08 dB	- <u>0,08</u> dB	- <u>0.0%</u> dB
{11b} 75% BW LOWER BANDEDGE	FREQ 13.48 MHz	13.34 Mhz	13.25 MHz
75% BW LOWER BANDEDGE	I.L. PERF - 0.78 dB	- <u>0.29</u> dB	- <u>0.30</u> dB
{11c} 75% BW UPPER BANDEDGE F	REQ 155.98 MHz	1 <u>55.84</u> Mhz	15 <u>5.<b>75</b></u> мнz
75% BW UPPER BANDEDGE	I.L. PERF - <u>0.28</u> dB	- <u>0.29</u> dB	- <u>0.30</u> dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	<u>O. 20</u> dB	<u>0.21</u> dB	<u>0.22_</u> dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	<u>0.20</u> dB	0.21 dB	<u>C.22_dB</u>
Prepared in accordance with here GTD and			
Prepared in accordance with MIL-STD-100 CONTRACT NO.	SIZE CAGE CODE A 57032	DWG. NO. 63-0005-02	REV.
DADEN-ANTHONY ASSOCIATES INC.		SHEET	13



FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P228-012

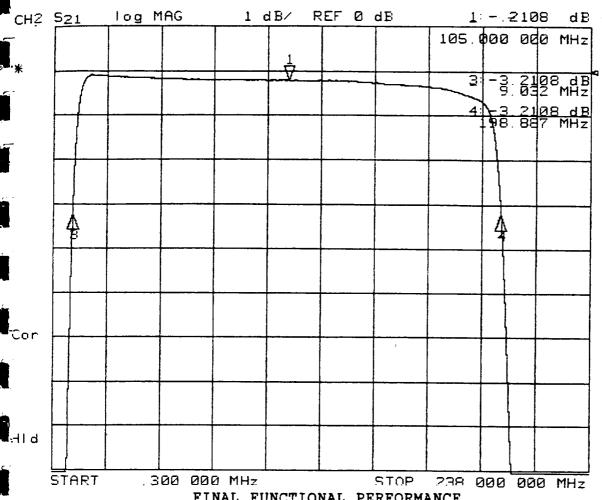
-10C DATA

MARKER PARAMETE OPR: R. HOGGATT DATE DEC 28 1996 nnel 2



FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P228-012

MARKER RODOMET	SERIAL NO. P228-012 +15C DATA OPR: R. HOGGATT DATE DEC 28 1996 annel 2
MARKER PARAMET	OPR: R. HOGGATT DATE DEC 20 SEC UTILET 2
MARKER 1	19.500000 MHz 105.000000 MHz OFF - 2034 dB
MARKER 2	190.500000 MHz 104.137374 MHz OFF OFF
MARKER 3	33.750000 MHz 9.039544 MHz OFF -3.2035 dB
MARKER 4	176.250000 MHz 199.235204 MHz OFF -3.2035 dB
MKR STIMULUS OFFSE	T 0.000000 MHz 89.425802 MHz 0 dB -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF OFF -14 dB -3 dB -3 dB OFF OFF OFF OFF



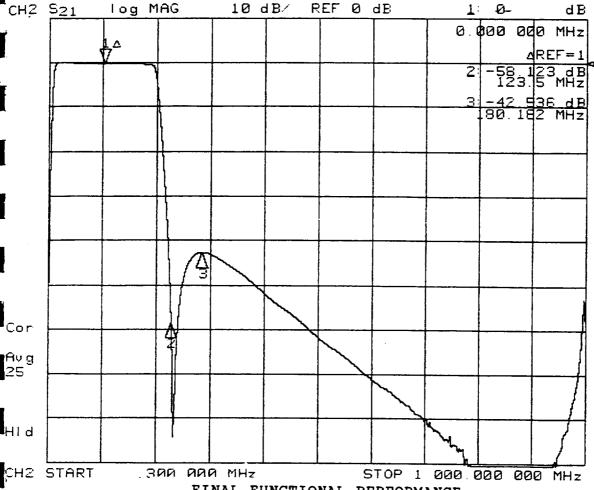
FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P228-012

+40C DATA

MARKER PARAMET OPR: R. HOGGATT DATE DEC 28 1996 annel 2

MARKER 1	19.500000 MHz OFF	105.000000 MHz 2108 dB
MARKER 2	190.500000 MHz OFF	103.959768 MHz OFF
MARKER 3	33.750000 MHz Off	9.032209 MHz -3.2108 dB
MARKER 4	176.250000 MHz OFF	198.887327 MHz -3.2108 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
⇒LACEMENT	OFF CONTINUOUS OFF -14 dB -3 dB OFF OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF

#### APPENDIX B ACCEPTANCE TEST REPORT BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-012 AEROJET 1331559-2 REV. 1 PASSBAND RIPPLE (CON'T) {11f} RECORD PASS/FAIL (0.5 dB MAX) (PASS)FAIL (11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S) **OUT-OF-BAND REJECTION** ACCEPTANCE TEST PROCEDURE -10°C +15°C +40°C 63-0005-02 PARA 4.5.5 Fc=105.0 MHz. REF (5A) FOR INSERTION LOSS @ Fc -59.0dB -59.0 dB -59.0 dB {12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) -42.5 dB {13a} WORST CASE REJECTION FROM -42.6 dB -42.6 dB 228.5 MHz TO 1000.0 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) {13c} RECORD MEASURED TEMPERATURE -14.5 °C +15.7 °C +43.5 °C (-15.0 TO -10.0) (12.5 TO 17.5) (40.0 TO 45.0) **{14} ATTACH REJECTION PERFORMANCE** X-Y PLOT(S) DATE 12/25 Not witnessed NOTE IF TEST WITNESSED BY AESD: GSI: \_ this time. DLD \*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\* **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION** {16} REFERENCE CUSTOMER DRAWING 1331559 **DESCRIPTION OF DIMENSION AND ACTUAL MEASUREMENT** TOLERANCE MEASUREMENT 3.502 **OVER ALL LENGTH** $3.50 \pm .03$ 0.127 10000 (SC) MOUNTING HOLE CENTER $0.125 \pm .010$ BETWEEN UPPER MOUNTING HOLES 3.250 3.250 **BETWEEN LOWER MOUNTING HOLES** 3.250 3.250 Prepared in accordance with MIL-STD-100 CONTRACT NO SIZE CAGE CODE DWG. NO. REV. Α 57032 63-0005-02 DADEN-ANTHONY ASSOCIATES INC. FILE: ACAD/63/0502APBJ.DOC SHEET 14

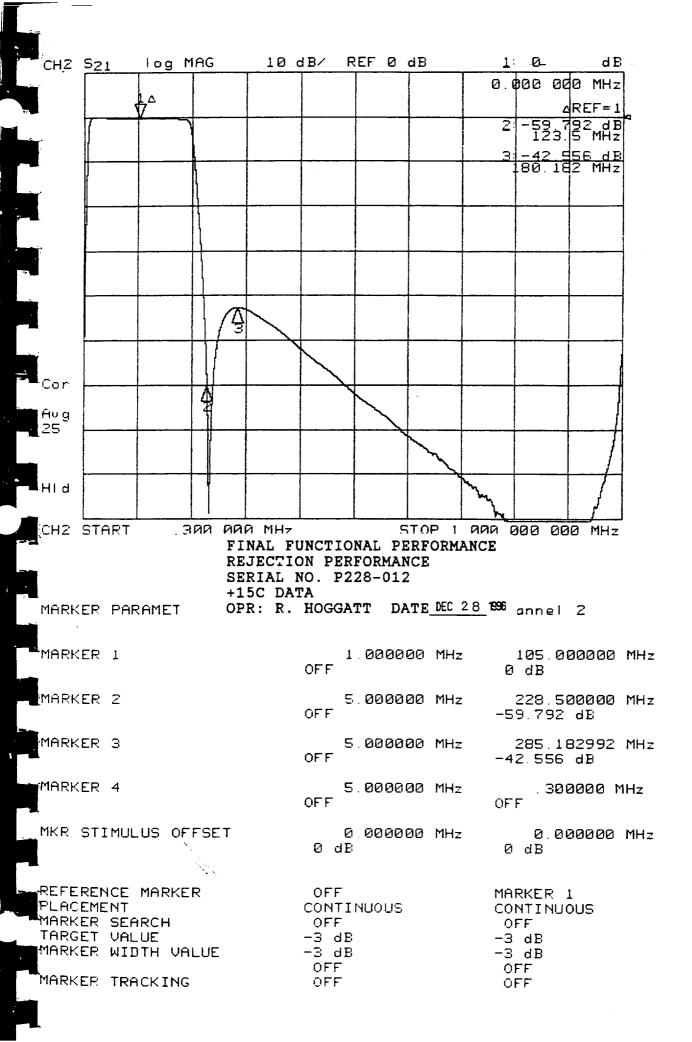


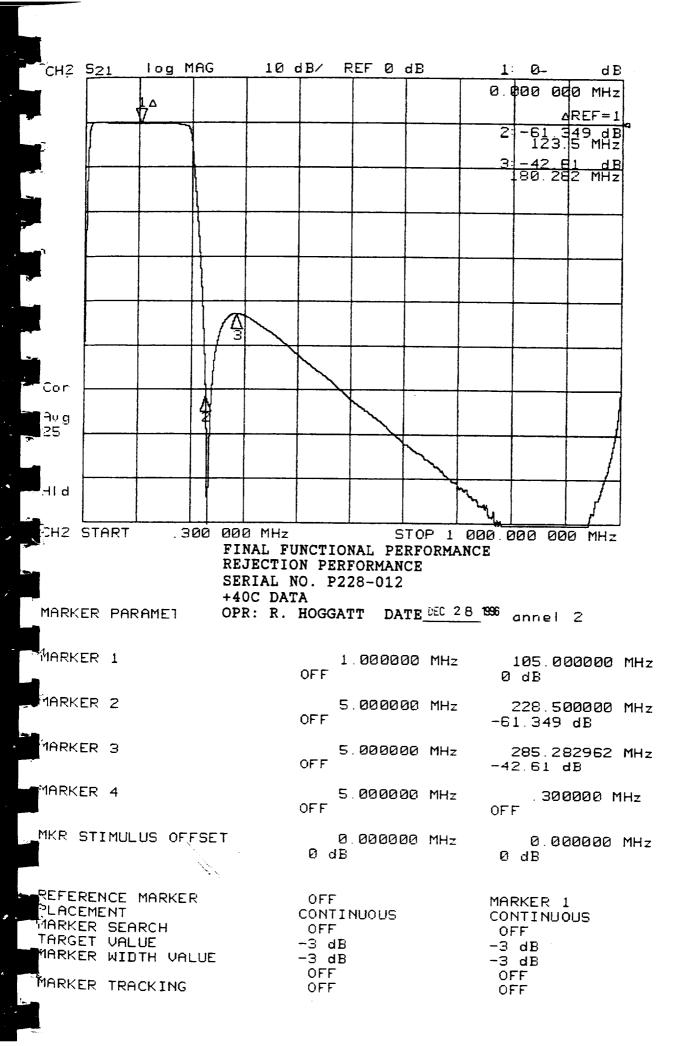
FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P228-012

-10C DATA

MARKER PARAMET OPR: R. HOGGATT DATE DEC 28 1996 annel 2

MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -58.123 dB
MARKER 3	5.000000 MHz OFF	285.182992 MHz -42.536 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF	MARKER 1 CONTINUOUS OFF -3 dB -3 dB OFF OFF





### **APPENDIX B**

#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N PZZS-CIZ AEROJET 1331559-2 REV.

# **BANDPASS CHARACTERISTICS MEASUREMENT**

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE + 22.6 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	<u>-83.6</u> dB	F11	(*) 130.0	MHz	-C.19 dB
F2	1.0	MHz	-66.7 dB	F12	(*) 150.0	MHz	-0.28 dB
F3	5.0	MHz	-17.5 dB	F13	180.0	MHz	-0.44 dB
F4	7.5	MHz	-7.14 dB	F14	190.0	MHz	-0.63 dB
F5	10.0	MHz	-1.65 dB	F15	200.0	MHz	-397 dB
F6	20.0	MHz	-0.08 dB	F16	250.0	MHz	-49.0 dB
F7	40.0	MHz	-0.11 dB	F17	300.0	MHz	-43.2 dB
F8	(*) 60.0	MHz	-OIL dB	F18	400.0	MHz	-52.0 dB
F9	(*) 80.0	MHz	-0.19 dB	C 510	500.0	MHz	-61.9 dB
F10	105.0	MHz	-0.19 dB	F20	1000.0	MHz	-57.5 dB

TEST PERFORMED BY: 12 HOGGAN DATE 12/27/90

NOTE IF TEST WITNESSED BY AESD \_\_\_\_\_ GSI \_ this time. DLD

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

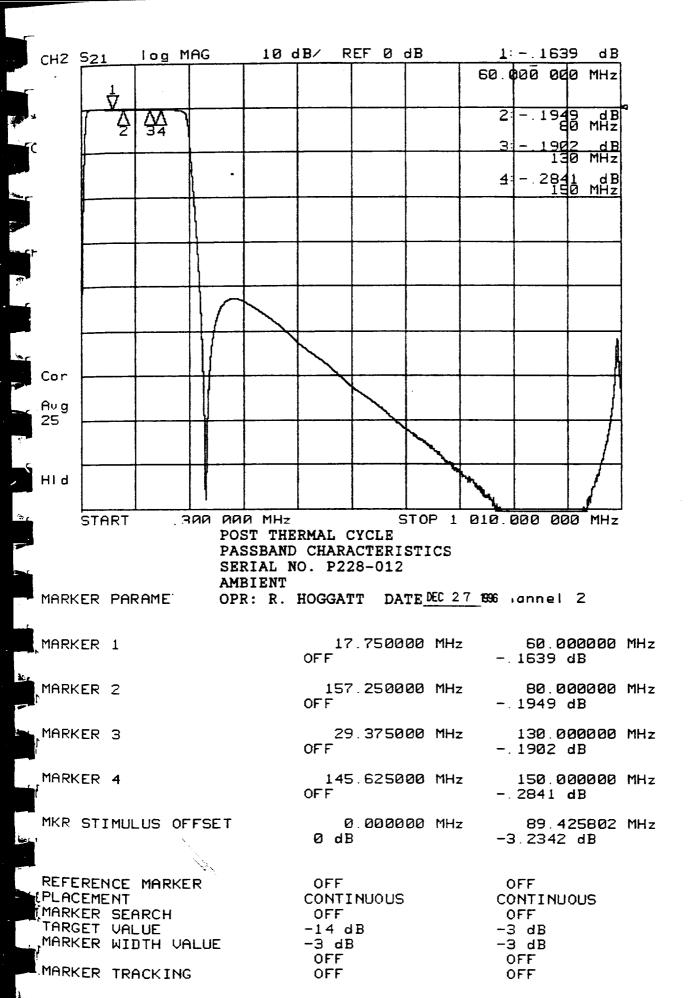
# **FUNCTIONAL PERFORMANCE TEST**

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

Prepared in accordance with MIL-STD-100 CONTRACT NO.	SIZE A	CAGE CODE 57032	DWG. NO. 63-0005-02	REV.
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APBJ.DOC	SHEET	11



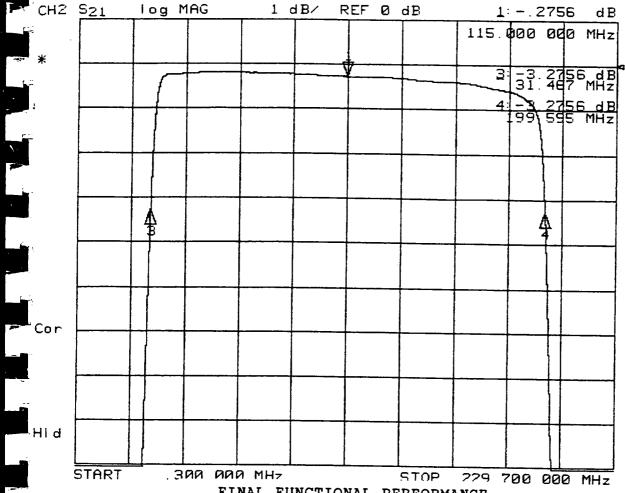
1.1

# **Channel 5 Bandpass Filter**

IF Filter (S/N: 1331559-5, S/N: P231-005)

ı			

APPENDIX E ACCEPTAI	NCE TEST REPOR	RT					
BANDPASS FILTER MODEL HL115-170-10S AEROJET 1331559-5 REV.	BANDPASS FILTER MODEL HL115-170-10SS1 S/N PZ31-605 AEROJET 1331559-5 REV. F.						
3.0 dB BANDWIDTH ACCEPTANCE TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C				
{7} UPPER 3.0 dB BANDEDGE	1 <u>99.60</u> MHz (198.0-200.0)	1 <u>99.26</u> Mhz (198.0-200.0)	1 <u>98.93</u> MHz (198.0-200.0)				
(8) LOWER 3.0 dB BANDEDGE	31.47 MHz (30.0-32.0)	31.40 Mhz (30.0-32.0)	3 <u>1.34</u> MHz (30.0-32.0)				
(9) 3.0 dB RELATIVE BANDWIDTH	1 <u>68.13</u> MHz (166.0-170.0)	<u> 67.86</u> Mhz (166.0-170.0)	16 <u>7.59 M</u> Hz (166.0-170.0)				
{10} ADD {7} AND {8} ÷ 2 =	11 <u>5.54</u> MHz (115.0 NOM)	1 <u>15.33</u> MHz (115.0 NOM)	11 <u>5.20</u> Mhz (115.0 NOM)				
(10a) RECORD MEASURED TEMPERATURE	(-15.0 TO -10.0)		+ <u>42.3</u> °C (40.0 TO 45.0)				
(6) ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	<u> </u>	<u>√</u> (√)	<u>(</u> 1)				
PASSBAND RIPPLE ACCEPTANCE TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C				
{11a} MIN INSERTION LOSS FREQ	59.94 MHz	57.08 Mhz	59.94 MHz				
MIN INSERTION LOSS PERFORMANC	E - <u>0.20</u> dB	- <u>0.21</u> dB	- <u>0.22</u> dB				
{11b} 75% BW LOWER BANDEDGE FREQ	35.24 MHz	35,15 Mhz	3 <u>5.03</u> MHz				
75% BW LOWER BANDEDGE I.L. PERF	F <u>-0.40</u> dB	- <u>0.47</u> dB	- <u>0.44</u> dB				
{11c} 75% BW UPPER BANDEDGE FREQ	1 <u>62.79</u> MHz	167.65Mhz	16 <u>2.53</u> MHz				
75% BW UPPER BANDEDGE I.L. PERF	- <u>0.40</u> dB	- <u>0.47</u> dB	- <u>0,44</u> dB				
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	<u>O.2O</u> dB	<u>0.21</u> dB	<u>0.22</u> dB				
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	<u>O.2O</u> dB	0.21 dB	<u>0.22</u> dB				
repared in accordance with MiL-STD-100							
CONTRACT NO. SIZE (	57032	DWG. NO. 63-0005-02	REV.				
DADEN-ANTHONY ASSOCIATES INC. FILE ACAD	0/63/0502APEJ.DOC	SHEET	13				

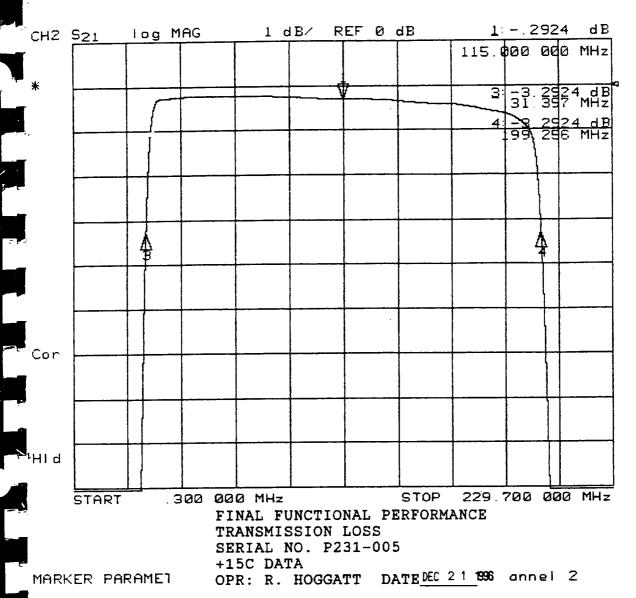


FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P231-005

-10C DATA

MARKER PARAMET OPR: R. HOGGATT DATEDEC 2 1 1996 annel 2

MARKER 1	38.500000 MHz OFF	115.000000 MHz 2756 dB
MARKER 2	191.500000 MHz OFF	115.531602 MHz OFF
MARKER 3	51.250000 MHz OFF	31.467571 MHz -3.2756 dB
MARKER 4	178.750000 MHz OFF	199.595633 MHz -3.2756 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF -14 dB -3 dB OFF OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF



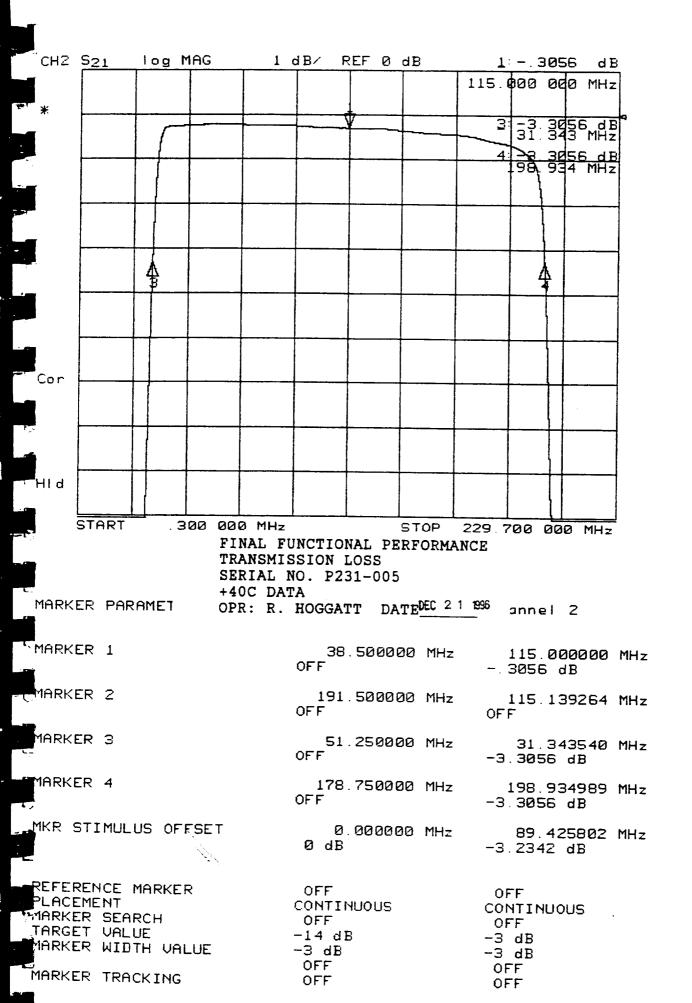
START 300 000	MHz STOP 2	29.700 000 MHz
TRA	AL FUNCTIONAL PERFORMANC NSMISSION LOSS IAL NO. P231-005	E
	C DATA: R. HOGGATT DATE DEC 2 1	1996 annel 2
'MARKER 1	38.500000 MHz OFF	115.000000 MHz 2924 dB
MARKER 2	191 500000 MHz OFF	115.327465 MHz OFF
MARKER 3	51.250000 MHz OFF	31.397986 MHz -3.2924 dB
MARKER 4	178.750000 MHz OFF	199.256945 MHz -3.2924 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -14 dB -3 dB	OFF CONTINUOUS OFF -3 dB -3 dB

OFF

OFF

MARKER TRACKING

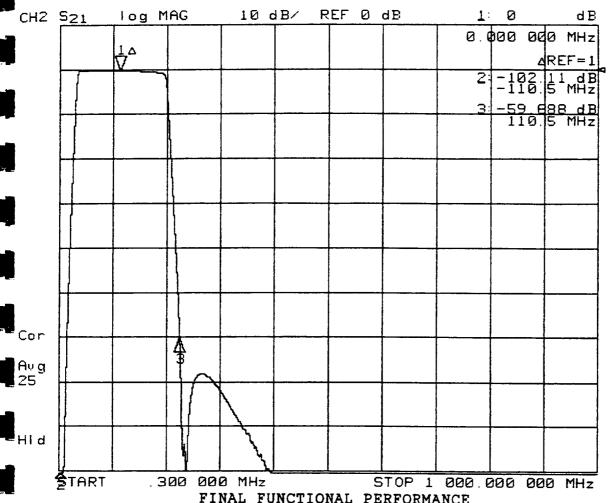
OFF OFF



#### APPENDIX E ACCEPTANCE TEST REPORT BANDPASS FILTER MCDEL HL115-170-10881 S/N P231-005 **AEROJET 133**1559-5 REV. **F** PASSBAND RIPPLE (CON'T) {11f} RECORD PASS/FAIL (0.5 dB MAX) (PASS)FAIL PASSAFAIL (PASS/FAIL (11g) ATTACH PASSBAND RIPPLE **PERFORMANCE** X-Y PLOT(S) **OUT-OF-BAND REJECTION** ACCEPTANCE TEST PROCEDURE -10°C +15°C +40°C 63-0005-010 PARA 4.5.5 Fc=115.0 MHz. REF (5A) FOR INSERTION LOSS @ Fc {12} WORST CASE REJECTION FROM 790 dB >90 dB >90 dB 0.300 MHz TO 4.5 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) (13a) WORST CASE REJECTION FROM -597 dB -60.5 dB -61.8 dB 225.5 MHz TO 1000.0 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) {13c} RECORD MEASURED TEMPERATURE -13.4 ℃ +15,8°C +42.3 ℃ (-15.0 TO -10.0) (12.5 TO 17.5) (40.0 TO 45.0) 141 ATTACH REJECTION PERFORMANCE V (1) (1) X-Y PLOT(S) 5 DATE 12/21/96 TEST PERFORMED BY 16. HOGGET NOTE IF TEST WITNESSED BY AESD: \_\_\_\_\_ GSI: NOT WITNESSED this time. DLD \*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\* **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION {16} REFERENCE CUSTOMER DRAWING 1331559 DESCRIPTION OF** DIMENSION AND ACTUAL **MEASUREMENT** TOLERANCE **MEASUREMENT OVER ALL LENGTH** 3.50 + .033.499 MOUNTING HOLE CENTER $0.125 \pm .010$ ().125 BETWEEN UPPER MOUNTING HOLES 3.250 3.250 BETWEEN LOWER MOUNTING HOLFS 3.250 3.251 Prepared in accordance with MIL-STD-100 CONTRACT NO. SIZE CAGE CODE DWG. NO. REV. Α 57032 63-0005-02 DADEN-ANTHONY ASSOCIATES INC. FILE: ACAD/63/0502APEJ.DOC

SHEET

14



FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P231-005

-10C DATA

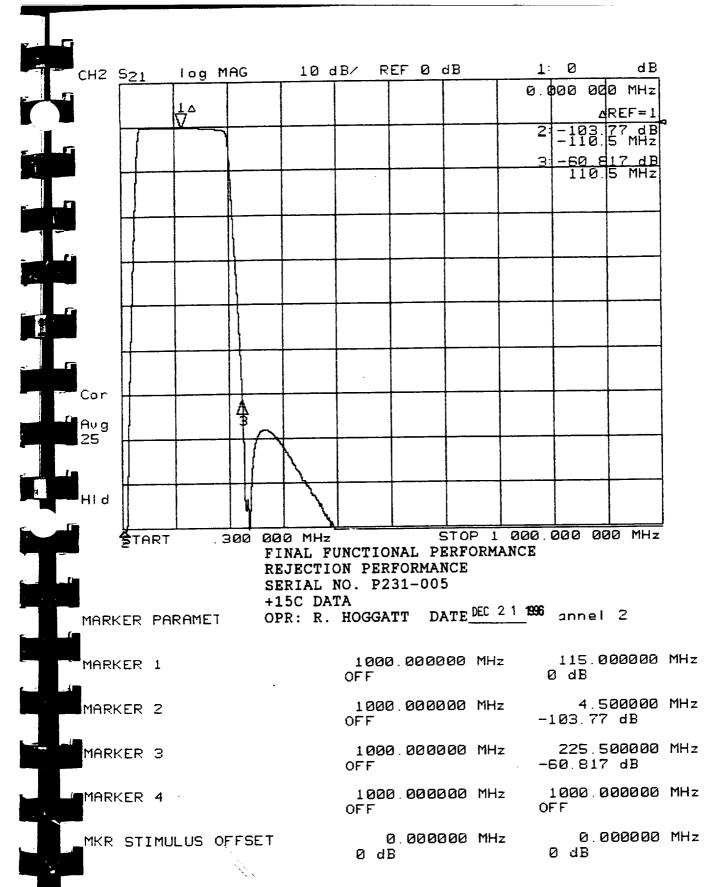
MARKER PARAMET OPR: R. HOGGATT DATE DEC 2 1 1996 annel 2

MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -102.11 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -59.688 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE	OFF CONTINUOUS OFF -3 dB	MARKER 1 CONTINUOUS OFF

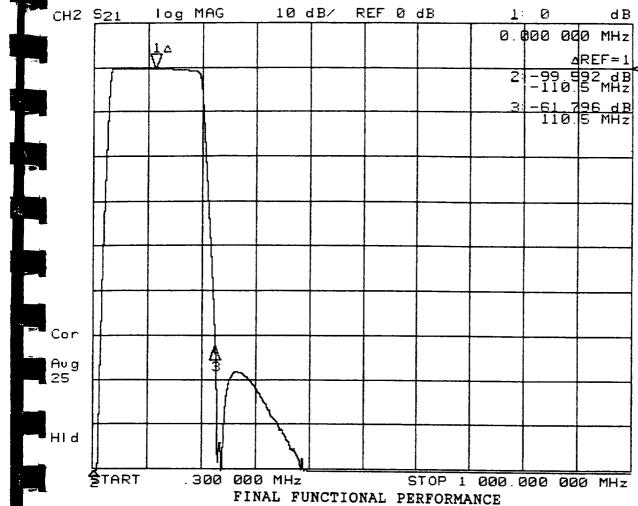
MARKER SEARCH
TARGET VALUE
MARKER WIDTH VALUE
MARKER TRACKING

OFF
CONTINUOUS
OFF
-3 dB
-3 dB
OFF
OFF

CONTINUOUS
OFF
-3 dB
-3 dB
OFF
OFF



REFERENCE MARKER MARKER 1 OFF CONTINUOUS CONTINUOUS PLACEMENT OFF OFF MARKER SEARCH -3 dB TARGET VALUE -3 dB -3 dB MARKER WIDTH VALUE -3 dB OFF OFF OFF MARKER TRACKING OFF



FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P231-005 +40C DATA

MARKER PARAMET

OPR: R. HOGGATT DATEDEC 2 1 1996 annel 2

MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -99.592 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -61.796 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
	OFF CONTINUOUS OFF -3 dB -3 dB OFF	MARKER 1 CONTINUOUS OFF -3 dB -3 dB OFF

#### **APPENDIX E**

#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-GO5 AEROJET 1331559-5 REV.

#### BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6

(REF: AE-2468T, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. + 72.0 °C (+19°C TO +29.0°C)

(15) ATTACH PASSBAND PERFORMANCE X-Y PLOT

/(1)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-107.7dB	F11	(*) 130.0	MHz	-0.31 dB
F2	1.0	MHz	<u>-107.3</u> dB	F12	(*) 155.0	MHz	-0.44 dB
F3	10.0	MHz	<u>-91.2</u> dB	F13	180.0	MHz	<u>- 0.63</u> dB
F4	20.0	MHz	<u>- 39.9</u> dB	F14	190.0	MHz	<u>-0.50 dB</u>
<b>F</b> 5	30.0	MHz	<u>- (。.67</u> dB	F15	200.0	MHz	-4.30 dB
F6	40.0	MHz	<u>- 0.75</u> dB	F16	210.0	MHz	-25.2 dB
F7	50.0	MHz	-0.24 dB	F17	300.0	MHz	-71.9 dB
F8	<b>(*)</b> 75.0	MHz	<u>-0.24</u> dB	F18	400.0	MHz	<u>-42.7</u> dB
F9	<b>(*)</b> 100.0	MHz	<u>-0.79</u> dB	F19	500.0	MHz	<u>-99.3</u> dB
F10	115.0	MHz	<u>- 0.31</u> dB	F20	1000.0	MHz	-107.9dB

TEST PERFORMED BY: 12. HOGGATT 5 DATE 12/21/96

NOTE IF TEST WITNESSED BY AESD\_\_\_\_\_GSI\_ Mot witnessed this time. DLD

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

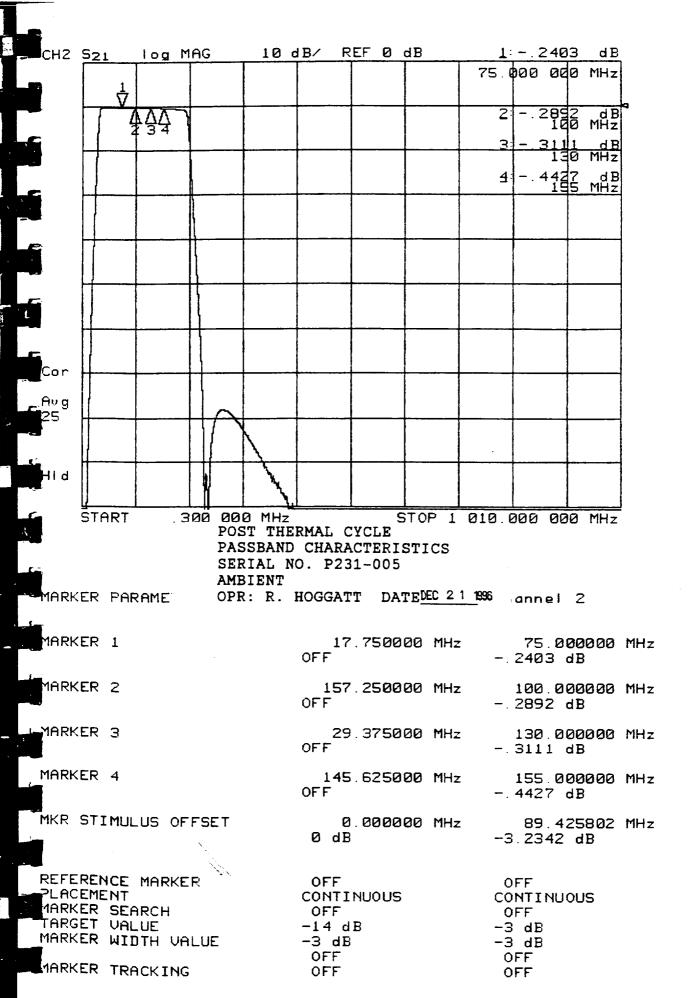
#### **FUNCTIONAL PERFORMANCE TEST**

**ACCEPTANCE TEST PROCEDURE 63-0005-010 PARA 4.1** 

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX E PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

 Prepared in accordance with MIL-STD-100
 SIZE CAGE CODE A 57032
 DWG. NO. BEV. A 57032
 REV. BUTCH A 57032
 DWG. NO. BEV. BUTCH A 57032
 REV. BUTCH A 57032
 SHEET
 11

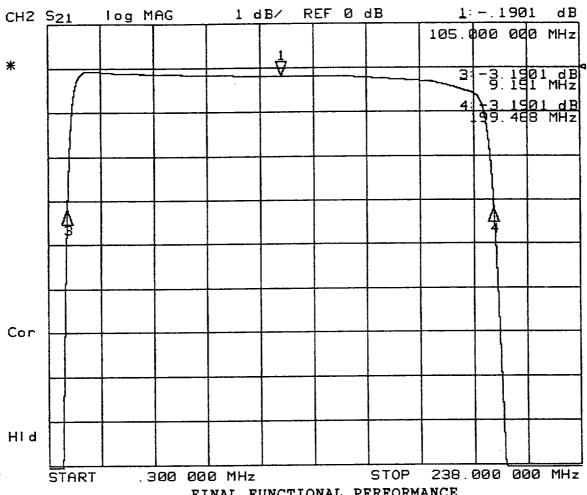


# Channel 6 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-005)

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			and the
			-
1			

APPENDIX B	ACCEPTANCE TEST REP	ORT	
BANDPASS FILTER MODEL H AEROJET 1331559-2 REV. E	L105-190-10SS1 S/N_P225	<u>8</u> -005	
3.0 dB BANDWIDTH ACCEPTANCE TEST PROCED 63-0005-02 PARA 4.5.3	OURE -10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	<u>199.47</u> мн (198.0-200.0		1 <u>98.78 </u> MHz (1480.01500.0)
(8) LOWER 3.0 dB BANDEDGE	<u>9.15</u> MH: (8.0-10.0)	z <u>9.14 Mhz</u> (8.0-10.0)	<u>9.13 MHz</u> (8.0-10.0)
(9) 3.0 dB RELATIVE BANDWID	OTH 1 <u>90.32</u> MH; (188.0-192.0		<u>89.65</u> MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	1 <u>04.31</u> mH; (105.0 NOM)		103.90 Mhz (105.0 NOM)
{10a} RECORD MEASURED TE	(-15.0 TO -10.	0) (12.5 TO 17.5)	+ <u>43.0</u> °C (40.0 TO 45.0)
(6) ATTACH TRANSMISSION L PERFORMANCE X-Y PLOT	oss <u>(</u> (\forall)	<u> </u>	<u> </u>
PASSBAND RIPPLE ACCEPTANCE TEST PROCEDI 63-0005-02 PARA 4.5.4	URE -10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS F	REQ <u>19.32</u> MHz	19.91 Mhz	19.32 MHz
MIN INSERTION LOSS P	PERFORMANCE -0.07 dB	- <u>0.0%</u> dB	- <u>0.08</u> dB
{11b} 75% BW LOWER BANDE	DGE FREQ 13.84 MHz	13.68 Mhz	<u>13.58 mHz</u>
75% BW LOWER BANDE	EDGE I.L. PERF -0.26 dB	- <u>0.28</u> dB	- <u>030</u> dB
{11c} 75% BW UPPER BANDED	OGE FREQ 1 <u>56.34 m</u> Hz	1 <u>56.18</u> Mhz	1 <u>56.08</u> MHz
75% BW UPPER BANDE	DGE I.L. PERF - 0.26 dB	- <u>0.28</u> dB	- <u>0.30</u> dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a	0.19 dB	<u>O.20</u> dB	<u>0.22</u> dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a	<u>0.19</u> dB	<u>0.20</u> dB	<u>0.22</u> dB
Prepared in accordance with MIL-STD-100			
CONTRACT NO.	SIZE   CAGE CODE   A   57032	DWG. NO. 63-0005-02	REV.
<b>DADEN-ANTHONY ASSOCIATES</b>	INC. FILE: ACAD/63/0502APBJ.DOC	SHEET	13



FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P228-005

-10C DATA

OPR: R. HOGGATT DATE DEC 27 1996 annel 2 MARKER PARAMET

MARKER 1	19.500000 MHz OFF	105.000000 MHz 1901 dB
MARKER 2	190.500000 MHz OFF	104.309850 MHz OFF
MARKER 3	33.750000 MHz OFF	9.151394 MHz -3.1901 dB
MARKER 4	176.250000 MHz OFF	199.468307 MHz -3.1901 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -14 dB -3 dB	OFF CONTINUOUS OFF -3 dB -3 dB

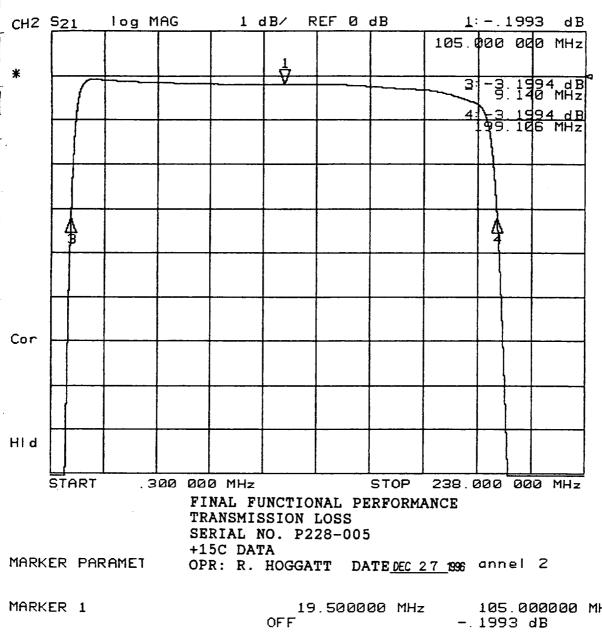
-3 dB OFF

OFF

OFF

OFF

MARKER TRACKING



MARKER 1	19.500000 MHz OFF	105.000000 MHz 1993 dB
MARKER 2	190.500000 MHz OFF	104.123676 MHz OFF
MARKER 3	33.750000 MHz OFF	9.140910 MHz -3.1994 dB
MARKER 4	176.250000 MHz OFF	199.106443 MHz -3.1994 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH	OFF CONTINUOUS OFF	OFF CONTINUOUS OFF

-14 dB

-3 dB

OFF

-3 dB

-3 dB

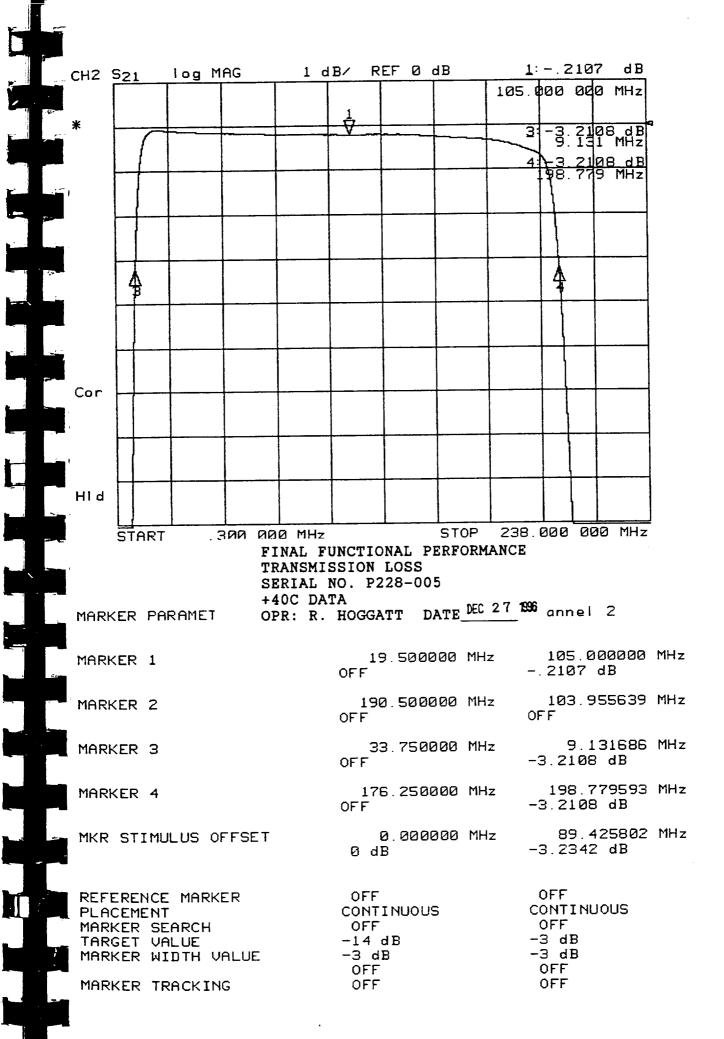
OFF

OFF

TARGET VALUE

MARKER TRACKING

MARKER WIDTH VALUE



#### APPENDIX B

#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N PZ28 -005 AEROJET 1331559-2 REV. し

#### PASSBAND RIPPLE (CON'T)

{11f}	RECORD	PASS/FAIL	(0.5 dB MAX)
1,,,,		TACOMAL	(0.5 45 1417 54)







(11g) ATTACH PASSBAND RIPPLE

PERFORMANCE X-Y PLOT(S)



#### **OUT-OF-BAND REJECTION**

ACCEPTANCE TEST PROCEDURE

-10°C

+15°C

+40°C

63-0005-02 PARA 4.5.5

Fc=105.0 MHz.

REF (5A) FOR INSERTION LOSS @ Fc

{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz

-59.3dB (40.0 dB MIN)

-59.Z dB (40.0 dB MIN) - 59.2 dB (40.0 dB MIN)

{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz

-<u>42.6</u> dB -<u>42.6</u> dB (40.0 dB MIN) (40.0 dB MIN -42.6 dB

(40.0 dB MIN)

-42.7 dB (40.0 dB MIN)

{13c} RECORD MEASURED TEMPERATURE

-13.6 ℃ (-15.0 TO -10.0) (12.5 TO 17.5)

+15.0°C

+43.1 °C (40.0 TO 45.0)

**{14} ATTACH REJECTION PERFORMANCE** 

X-Y PLOT(S)

TEST PERFORMED BY 16. HOGGATT DATE 12/27/91

Not witnessed NOTE IF TEST WITNESSED BY AESD: GSI: this time. DLD

\*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\*

## **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION**

**{16} REFERENCE CUSTOMER DRAWING 1331559** 

**DESCRIPTION OF** MEASUREMENT **OVER ALL LENGTH**  DIMENSION AND TOLERANCE

ACTUAL **MEASUREMENT** 

 $3.50 \pm .03$ 

3.500

**MOUNTING HOLE CENTER** 

 $0.125 \pm .010$ 

0.127

**BETWEEN UPPER MOUNTING HOLES** 

3.250

3.250

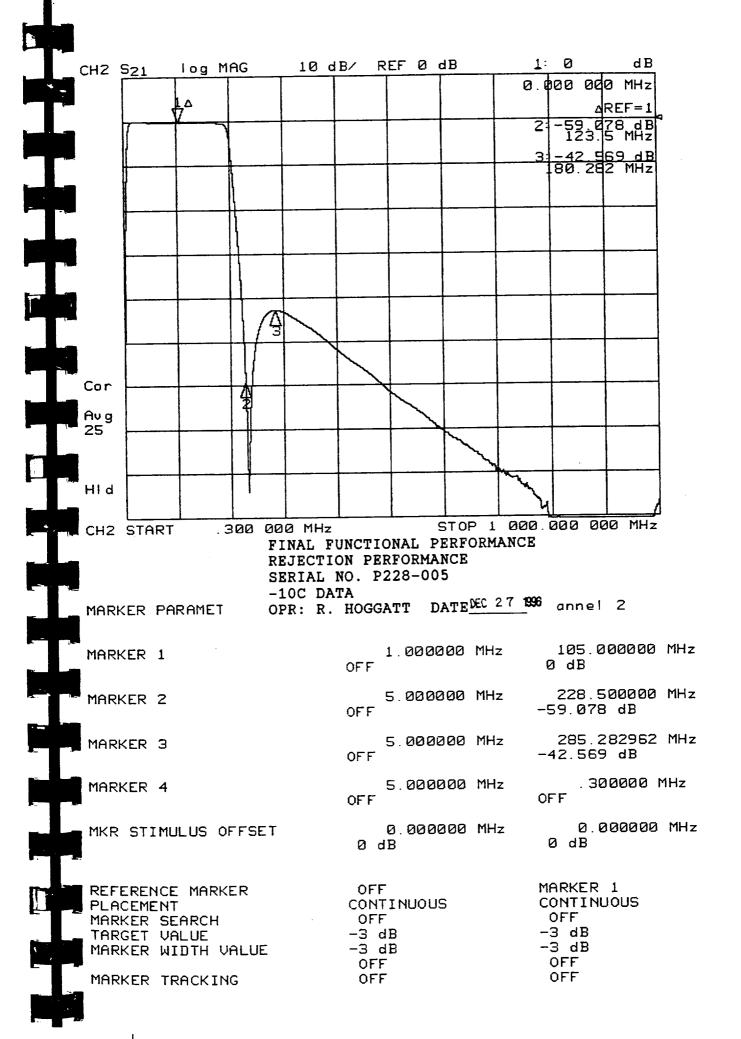
**BETWEEN LOWER MOUNTING HOLES** 

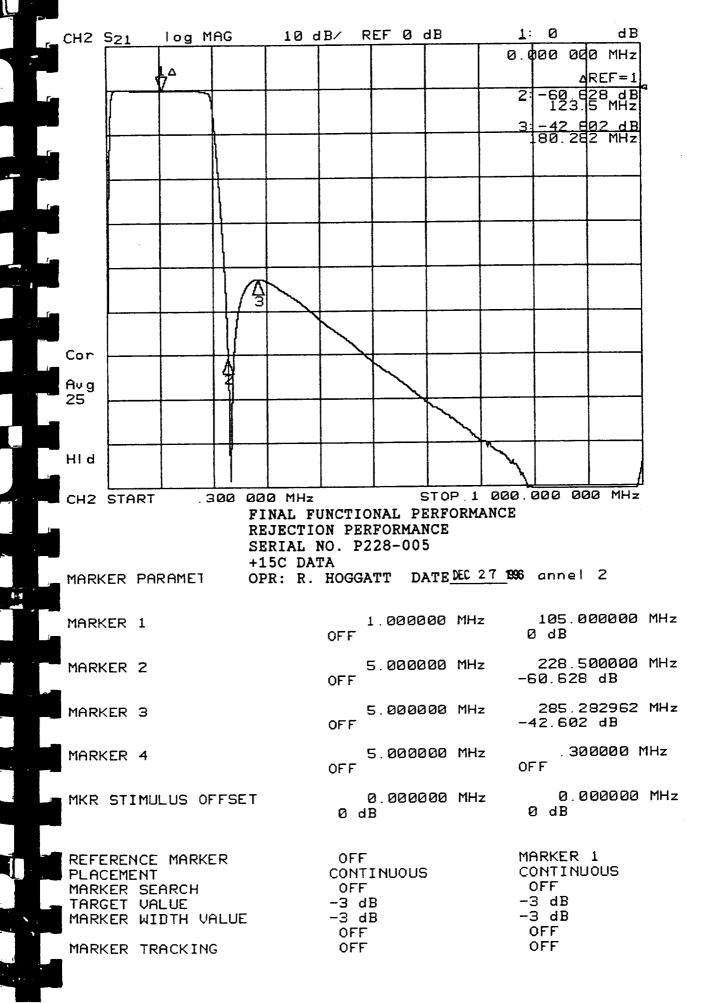
3.250

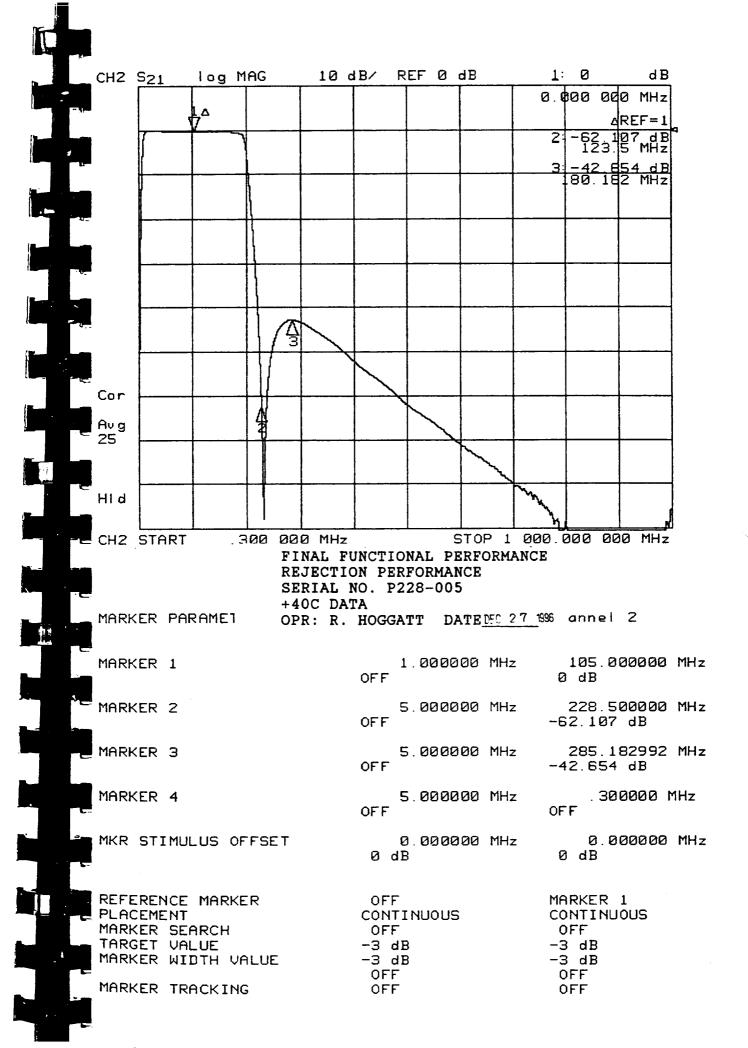
3.249

Prepared in accordance with MIL-STD-100

CONTRACT NO.	SIZE A	CAGE CODE <b>57032</b>	DWG. NO. <b>63-0005-02</b>	REV. J
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	:AD/63/0502APBJ.DOC	SHEET	14







#### APPENDIX B

#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-005 AEROJET 1331559-2 REV.

### BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. + 22.5 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

/(1)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	<u>-87.7</u> dB	F11	(*) 130.0	MHz	-0.21 dB
F2	1.0	MHz	<u>- 66,3</u> dB	F12	(*) 150.0	MHz	-0.29 dB
F3	5.0	MHz	<u>-17,8 dB</u>	F13	180.0	MHz	-0.46 dB
F4	7.5	MHz	-7.40dB	F14	190.0	MHz	-0.66 dB
F5	10.0	MHz	<u>-1.79</u> dB	F15	200.0	MHz	-4.11 dB
F6	20.0	MHz	<u>-0.0%_</u> dB	F16	250.0	MHz	-48.8 dB
F7	40.0	MHz	-0.11 dB	F17	300.0	MHz	-43.3 dB
F8	(*) 60.0	MHz	<u>-0.17</u> dB	F18	400.0	MHz	-52.0 dB
F9	(*) 80.0	MHz	<u>-0.70 dB</u>	F19	500.0	MHz	-61.8 dB
F10	105.0	MHz	<u>- 0.22 dB</u>	DA F20	1000.0	MHz	-85.9 dB

TEST PERFORMED BY: 12. HOGGATT DATE 12/27/96

NOTE IF TEST WITNESSED BY AESD\_\_\_\_\_\_ GSI\_ this time. DLD

..... **-**..- --- ---

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

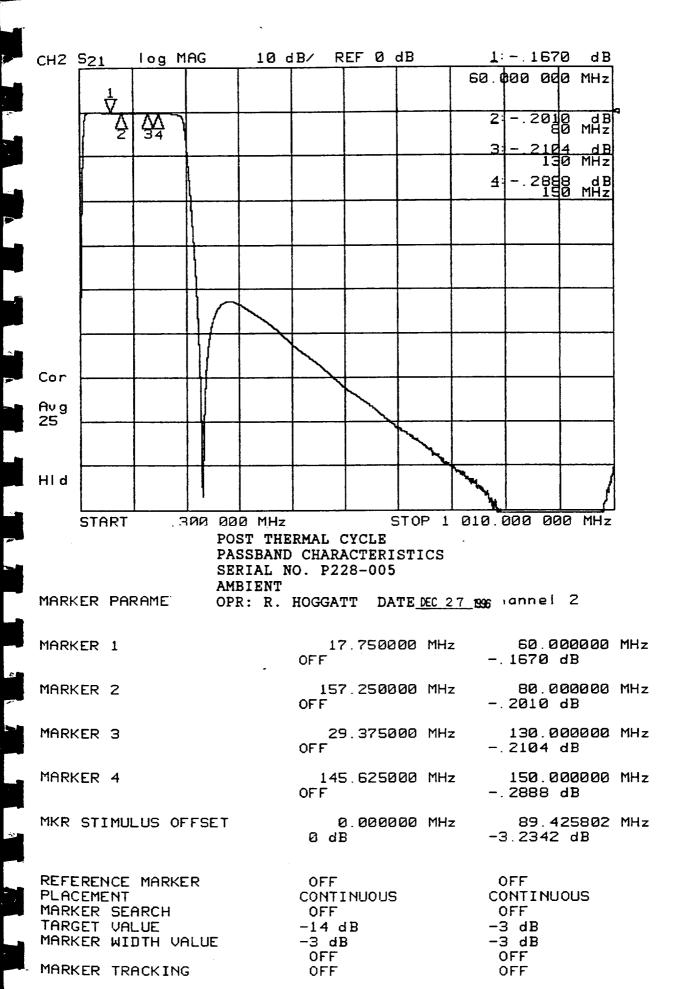
### FUNCTIONAL PERFORMANCE TEST

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

Prepared in accordance with MIL-STD-100				
CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.
	A	57032	63-0005-02	J
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APBJ.DOC	SHEET	11



# **Channel 7 Bandpass Filter**

IF Filter (S/N: 1331559-2, S/N: P228-007)

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			· . <del>-</del> -

AF	P	EI	ND	IX	В

#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-GO7 AEROJET 1331559-2 REV. €

<u>3.0</u>	<u>dB</u>	<u>BA</u>	<u>ND</u>	W	DT	<u>H</u>
AC	CEF	PTA	NC	E	TES	T

ACCEPTANCE TEST PROCEDURE	4000	.4500
ACCEPTANCE TEST PROCEDURE	-10°C	+15°C
63-0005-02 PARA 4 5 3		

{7} UPPER 3.0 dB BANDEDGE	199.62MHz	1 <u>99.28</u> Mhz	198.97MHz
	(198.0-200.0)	(198.0-200.0)	(1480.01500.0)

+40°C

104.04Mhz

104.38MHz

104.21 MHz

(6) ATTACH TRANSMISSION LOSS	(1)	<u> </u>	<u> </u>
PERFORMANCE X-Y PLOT	(V)	(V)	

# PASSBAND RIPPLE

 $\{10\}$  ADD  $\{7\}$  AND  $\{8\} \div 2 =$ 

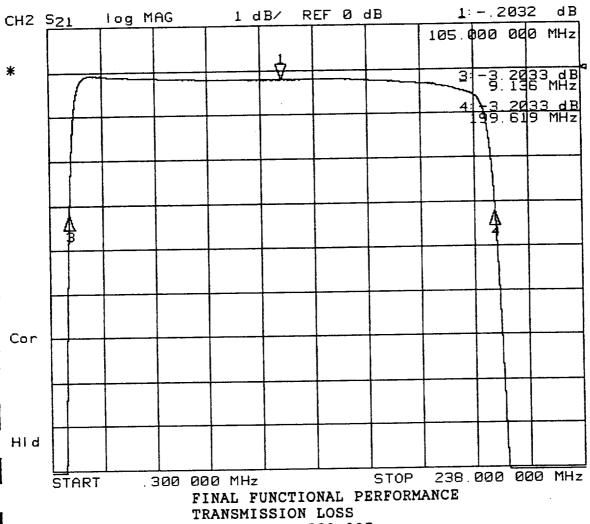
ACCEPTANCE TEST PROCEDURE	-10°C	+15°C	+40°C
63-0005-02 PARA 4 5 4			

{11a} MIN INSERTION LOSS FREQ	19.91 MHz	19.32 Mhz	1 <u>9.32</u> MHz

MIN INSERTION LOSS PERFORMANCE -0.07 dB -0.08 dB -0.08 dB	MIN INS	ERTION LOSS PERFORMAN	ICE <u>-0.07</u> dB	- <u>0.08</u> dB	- <u>0.08</u> d
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{11e} PERFORMANCE DELTA	0.20 dB	0.20 dB	0.21 dB
(l.L. @ {11c} - l.L. @ {11a})			

CONTRACT NO.	SIZE A	CAGE CODE <b>57032</b>	DWG. NO. <b>63-0005-02</b>	REV.	
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APBJ.DOC	SHEET	13	



SERIAL NO. P228-007

-10C DATA

MARKER PARAMET

MARKER TRACKING

OPR: R. HOGGATT DATE DEC 28 1996 annel 2

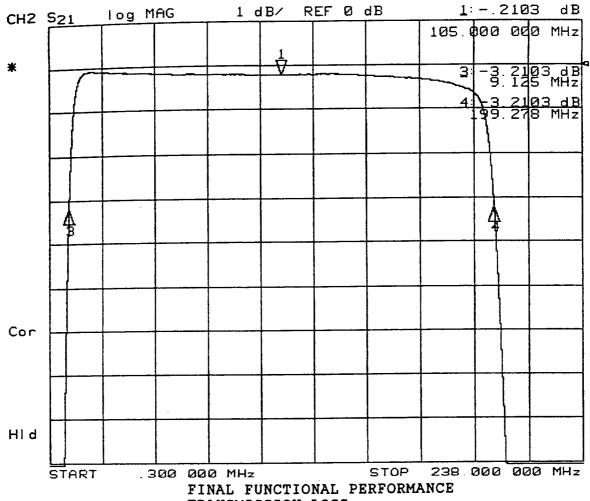
OFF

**OFF** 

MARKER 1	19.500000 MHz OFF	105.000000 MHz 2032 dB
MARKER 2	190.500000 MHz OFF	104.378379 MHz OFF
MARKER 3	33.750000 MHz OFF	9.136880 MHz -3.2033 dB
MARKER 4	176.250000 MHz OFF	199.619879 MHz -3.2033 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -14 dB -3 dB	OFF CONTINUOUS OFF -3 dB -3 dB

OFF

OFF



TRANSMISSION LOSS

SERIAL NO. P228-007

+15C DATA

MARKER PARAMET

TARGET VALUE

MARKER WIDTH VALUE

MARKER TRACKING

OPR: R. HOGGATT DATE DEC 28 1996 annel 2

-3 dB

-3 dB

OFF

OFF

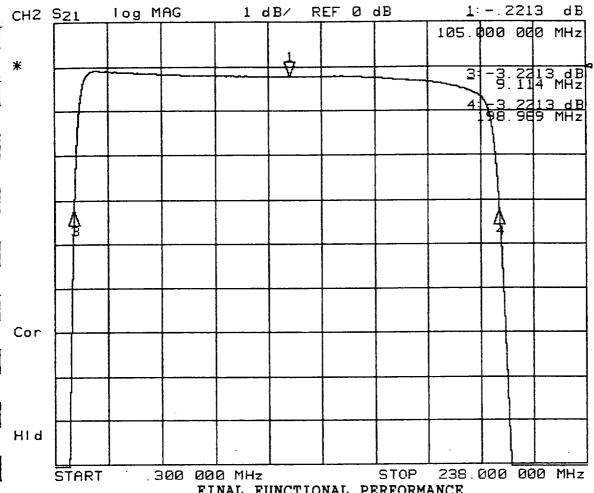
MARKER 1	19.500000 MHz OFF	105.000000 MHz 2103 dB
MARKER 2	190.500000 MHz OFF	104.201929 MHz OFF
MARKER 3	33.750000 MHz OFF	9.125757 MHz -3.2103 dB
MARKER 4	176.250000 MHz OFF	199.278101 MHz -3.2103 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH	OFF CONTINUOUS OFF	OFF CONTINUOUS OFF

-14 dB

-3 dB

OFF

OFF



FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P228-007

+40C DATA

MARKER PARAMET OPR: R. HOGGATT DATE DEC 28 1996 annel 2

l	MARKER 1	19.500000 MHz OFF	105.000000 MHz 2213 dB
	MARKER 2	190.500000 MHz OFF	104.042260 MHz OFF
	MARKER 3	33.750000 MHz OFF	9.114905 MHz -3.2213 dB
	MARKER 4	176.250000 MHz OFF	198.969616 MHz -3.2213 dB
	MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
	REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -14 dB -3 dB	OFF CONTINUOUS OFF -3 dB -3 dB

OFF

OFF

MARKER TRACKING

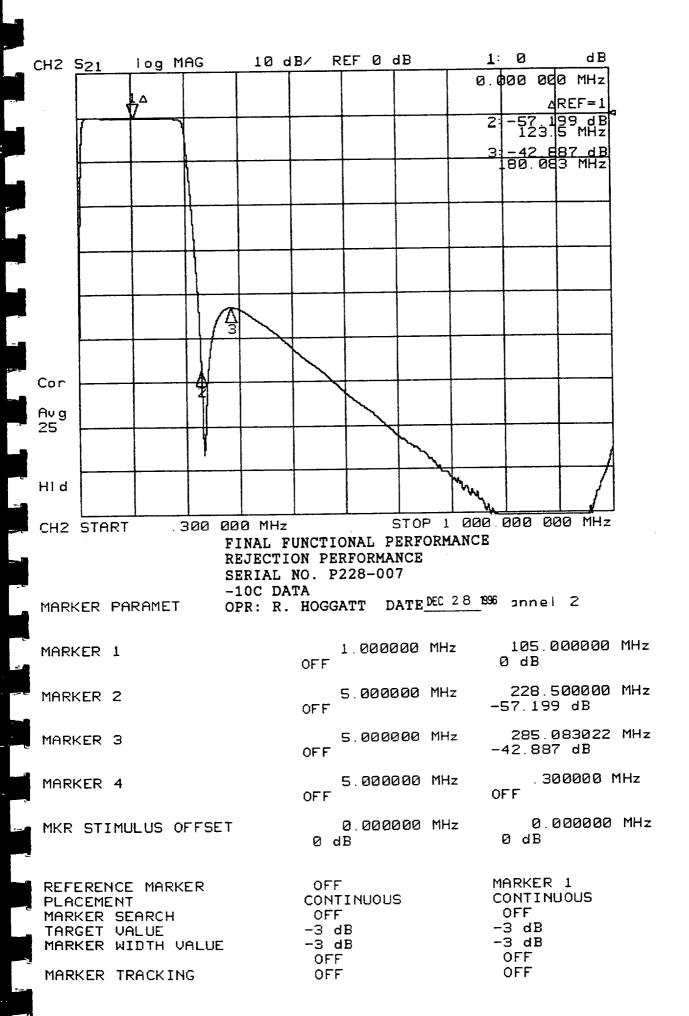
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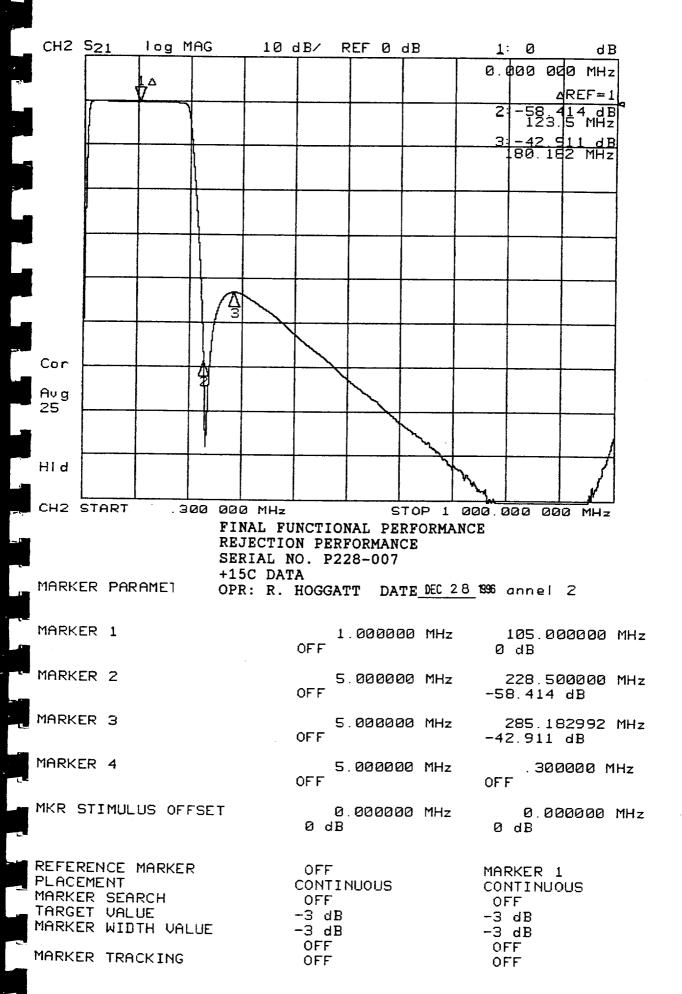
OFF

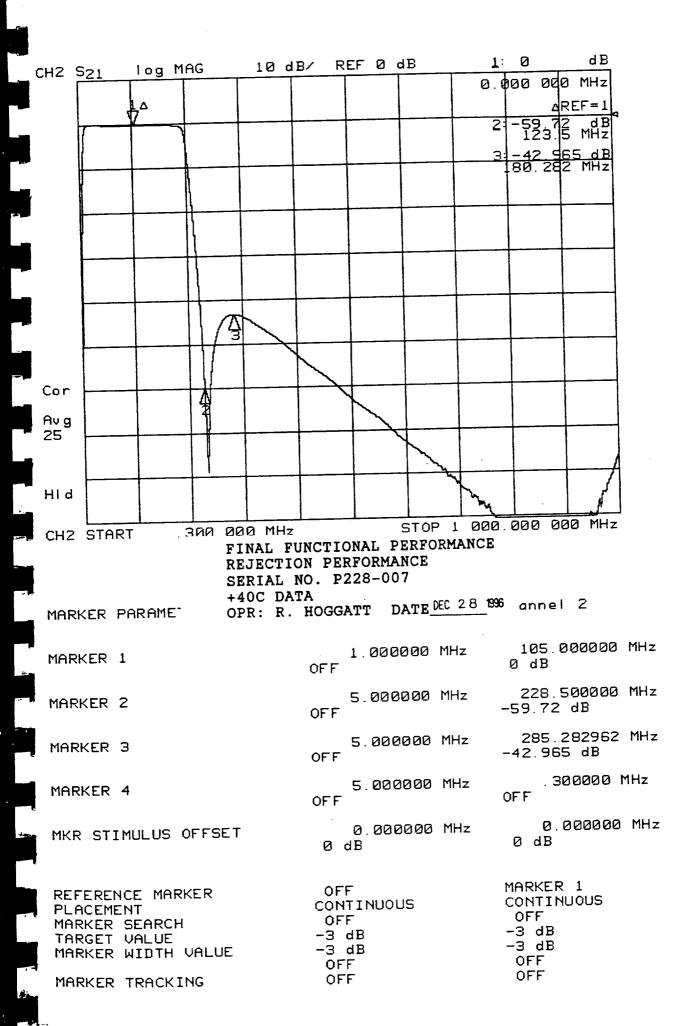
#### APPENDIX B **ACCEPTANCE TEST REPORT** BANDPASS FILTER MODEL HL105-190-10SS1 S/N PZZ8-007 AEROJET 1331559-2 REV. E PASSBAND RIPPLE (CON'T) {11f} RECORD PASS/FAIL (0.5 dB MAX) (PASS)FAIL (PASS/FAIL (11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S) **OUT-OF-BAND REJECTION** ACCEPTANCE TEST PROCEDURE -10°C +15°C +40°C 63-0005-02 PARA 4.5.5 Fc=105.0 MHz. REF (5A) FOR INSERTION LOSS @ Fc - 59.2 dB {12} WORST CASE REJECTION FROM - 59.2 dB -59.1 dB 0.300 MHz TO 1.0 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) {13a} WORST CASE REJECTION FROM -42.9 dB -42.9 dB -43.0 dB 228.5 MHz TO 1000.0 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) +42.9°C {13c} RECORD MEASURED TEMPERATURE -12.5 °C +15.6 ℃ (-15.0 TO -10.0) (12.5 TO 17.5) (40.0 TO 45.0) {14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S) TEST PERFORMED BY 16. HOGGATT DATE 12/28 Not witnessed \_GSI:\_ this time. DLD NOTE IF TEST WITNESSED BY AESD: \*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\* **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION {16} REFERENCE CUSTOMER DRAWING 1331559**

DESCRIPTION OF MEASUREMENT		DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGT	Н	3.50 ± .03	3.5∞
MOUNTING HOLE	CENTER	0.125 <u>+</u> .010	0.125
BETWEEN UPPER	MOUNTING HOLES	3.250	3.251
BETWEEN LOWER	R MOUNTING HOLES	3.250	3.251

Prepared in accordance with MIL-STD-100 CONTRACT NO.	SIZE A	CAGE CODE 57032	DWG. NO. 63-0005-02	REV.
DADEN-ANTHONY ASSOCIATES INC.			SHEET	14







#### APPENDIX B

#### ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL105-190-10SS1 S/N\_P228-007 AEROJET 1331559-2 REV. F

#### BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. + 22.9 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

\_\_\_\_(\forall )

**{24} TEST POINT MATRIX** 

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	<u>-81.8</u> dB	F11	(*) 130.0	MHz	- <u>0.20</u> dB
F2	1.0	MHz	<u>-65.%</u> dB	F12	(*) 150.0	MHz	- <u>0.27</u> dB
F3	5.0	MHz	<u>- 17.7   d</u> B	F13	180.0	MHz	<u>-ОНЗ dB</u>
F4	7.5	MHz	<u>- 7.34 dB</u>	F14	190.0	MHz	<u>-0.61</u> dB
F5	10.0	MHz	<u>- ۱،ገገ</u> dB	F15	200.0	MHz	<u>- 3.94 dB</u>
F6	20.0	MHz	-0.07 dB	F16	250.0	MHz	<u>-49.2</u> dB
F7	40.0	MHz	-0.10 dB	F17	300.0	MHz	<u>-43.6</u> dB
F8	(*) 60.0	MHz	-0.17 dB	F18	400.0	MHz	<u>-52.7_dB</u>
F9	(*) 80.0	MHz	-0.21 dB	F19	500.0	MHz	<u>-62.7 dB</u>
F10	105.0	MHz	-0.22 dB	F20	1000.0	MHz	<u>-76.0</u> dB

TEST PERFORMED BY: 12 HOGGAIL DATE 12/27/96

NOTE IF TEST WITNESSED BY AESD GSI this time. DLD

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

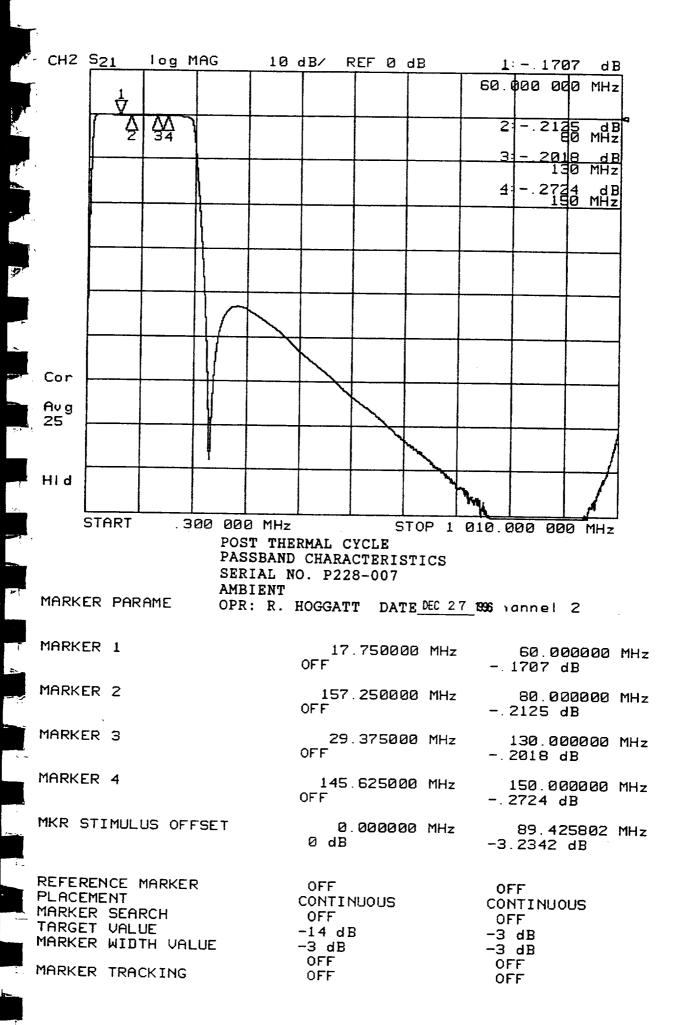
#### **FUNCTIONAL PERFORMANCE TEST**

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

Prepared in accordance with MIL-STD-100 CONTRACT NO.	SIZE A	CAGE CODE <b>57032</b>	DWG. NO. 63-0005-02	REV.
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APBJ.DOC	SHEET	11

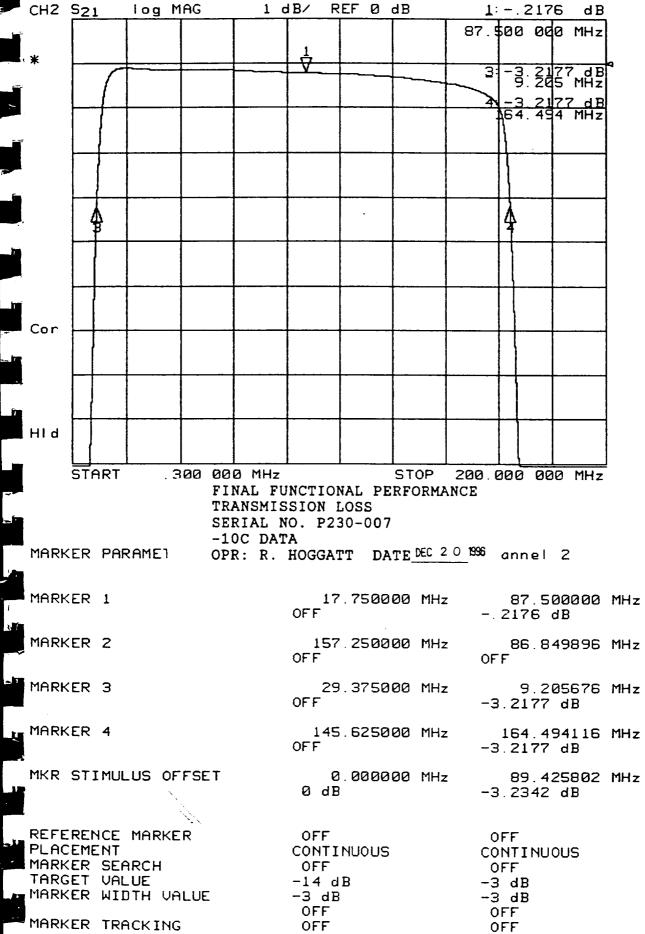


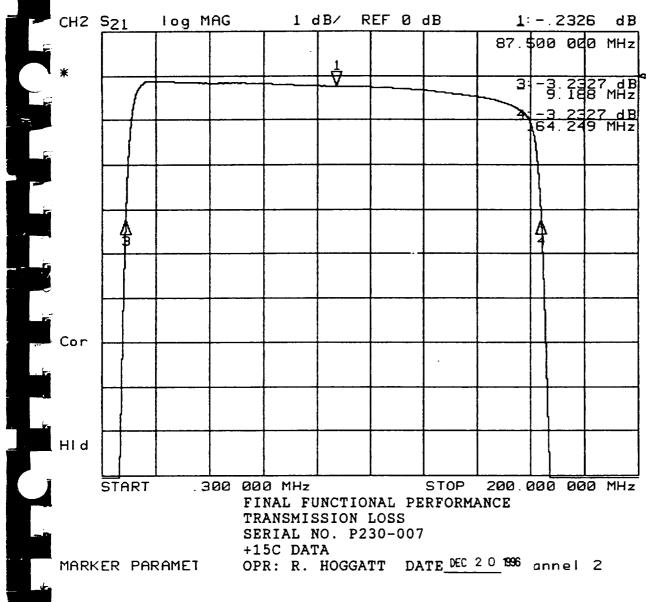
# **Channel 8 Bandpass Filter**

IF Filter (S/N: 1331559-4, S/N: P230-007)

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APPENDIX D AC	CEPTANCE TEST REPOR	RI	
BANDPASS FILTER MODEL HL87.5- AEROJET 1331559-4 REV.	-155-10881 S/N <u>PZ3C-</u> -	507	
3.0 dB BANDWIDTH ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	<u>に4.49</u> MHz (163.0-165.0)	1 <u>64.25</u> Mhz (163.0-165.0)	1 <u>63.97</u> MHz (163.0-165.0)
{8} LOWER 3.0 dB BANDEDGE	<u>9.21                                    </u>	9.19 Mhz (8.0-10.0)	<u>9.18</u> MHz (8.0-10.0)
(9) 3.0 dB RELATIVE BANDWIDTH	1 <u>55.28 </u> MHz (153.0-157.0)	1 <u>55.06</u> Mhz (153.0-157.0)	l 5 <u>4.79</u> mHz (153.0-157.0)
{10} ADD {7} AND {8} ÷ 2 =	<u>86.85</u> MHz (87.5 NOM) <sub>.</sub>	86.72 MHz (87.5 NOM)	<u>ઇ58</u> Mhz (87.5 NOM)
{10a} RECORD MEASURED TEMPER		+ <u>12.8</u> °C (12.5 TO 17.5)	+ <u>43.८</u> °C (40.0 TO 45.0)
(6) ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	<u> </u>	(1)	<u> </u>
PASSBAND RIPPLE ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.27 MHz	19.27 Mhz	19.27 MHz
MIN INSERTION LOSS PERFO	RMANCE -0.10 dB	- <u>0.11</u> dB	-0.11dB
{11b} 75% BW LOWER BANDEDGE F	REQ <u>13.38</u> MHz	1 <u>3.25</u> Mhz	1 <u>3.13</u> MHz
75% BW LOWER BANDEDGE I	.L. PERF - <u>0.36</u> dB	- <u>0.39</u> dB	- <u>0.41</u> dB
{11c} 75% BW UPPER BANDEDGE F	REQ 12 <u>9.63 MHz</u>	12 <u>9.50</u> Mhz	12 <u>9.38</u> MHz
75% BW UPPER BANDEDGE I.	L. PERF - <u>0.36</u> dB	- <u>0.39</u> dB	- <u>0.41</u> dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	<u>0.26</u> dB	<u>0.28</u> dB	<u>0.30</u> dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	<u>0.26</u> dB	<u>0.28</u> dB	<u>0,30</u> dB
Prepared in accordance with MIL-STD-100			
CONTRACT NO.	SIZE CAGE CODE A 57032	DWG. NO. 63-0005-02	REV.
DADEN-ANTIIONY ASSOCIATES INC.	FILE: ACAD/63/0502APDJ.DOC	SHEET	12



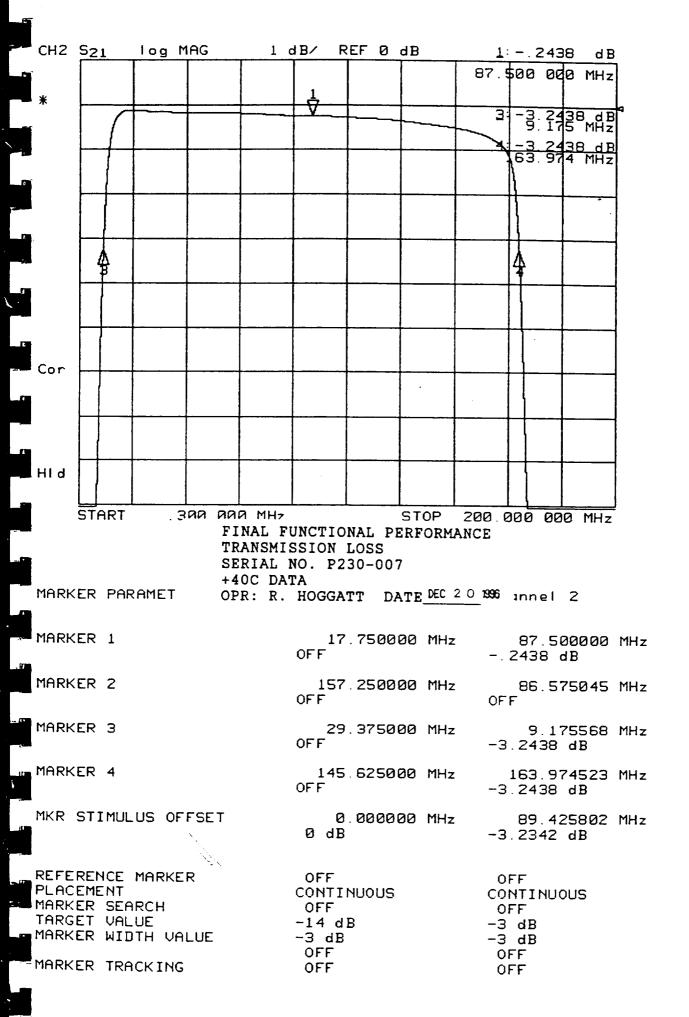


MARKER 1	17.750000 MHz OFF	87.500000 MHz 2326 dB
MARKER 2	157.250000 MHz OFF	86.719334 MHz OFF
MARKER 3	29.375000 MHz OFF	9.188803 MHz -3.2327 dB
MARKER 4	145.625000 MHz OFF	164.249866 MHz -3.2327 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -14 dB -3 dB OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF
<b>=</b> • • • • • • • • • • • • • • • • • • •		

OFF

**OFF** 

MARKER TRACKING



# **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N PZ30-007 AEROJET 1331559-4 REV. ヒ

### PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)

(PASS)FAIL

(PASS) FAIL

(11g) ATTACH PASSBAND RIPPLE

PERFORMANCE X-Y PLOT(S)

V(1)

**OUT-OF-BAND REJECTION** 

ACCEPTANCE TEST PROCEDURE

-10°C

+15°C

+40°C

63-0005-02 PARA 4.5.5

Fc=87.5 MHz.

REF (5A) FOR INSERTION LOSS @ Fc

{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz

 $-60.5 \, dB$ (40.0 dB MIN) -60.5 dB (40.0 dB MIN) -60.4 dB (40.0 dB MIN)

{13a} WORST CASE REJECTION FROM

188.25 MHz TO 1000.0 MHz

-61.5 dB (40.0 dB MIN) -62.4 dB(40.0 dB MIN)  $-63.5 \, dB$ (40.0 dB MIN)

{13c} RECORD MEASURED TEMPERATURE

-12.3 ℃ (-15.0 TO -10.0) (12.5 TO 17.5)

+12.8 °C

+43.2℃ (40.0 TO 45.0)

**{14} ATTACH REJECTION PERFORMANCE** 

X-Y PLOT(S)

TEST PERFORMED BY K. HOGGAN

DATE 12/20/96

Not witnessed NOTE IF TEST WITNESSED BY AESD: \_ this time. DLD

\*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\*

# **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION**

{16} REFERENCE CUSTOMER DRAWING 1331559

**DESCRIPTION OF** MEASUREMENT

DIMENSION AND

ACTUAL

TOLERANCE

MEASUREMENT

**OVER ALL LENGTH** 

 $3.50 \pm .03$ 

3.501

MOUNTING HOLE CENTER

 $0.125 \pm .010$ 

0.126 compass of

BETWEEN UPPER MOUNTING HOLES

3.250

3,250

BETWEEN LOWER MOUNTING HOLES

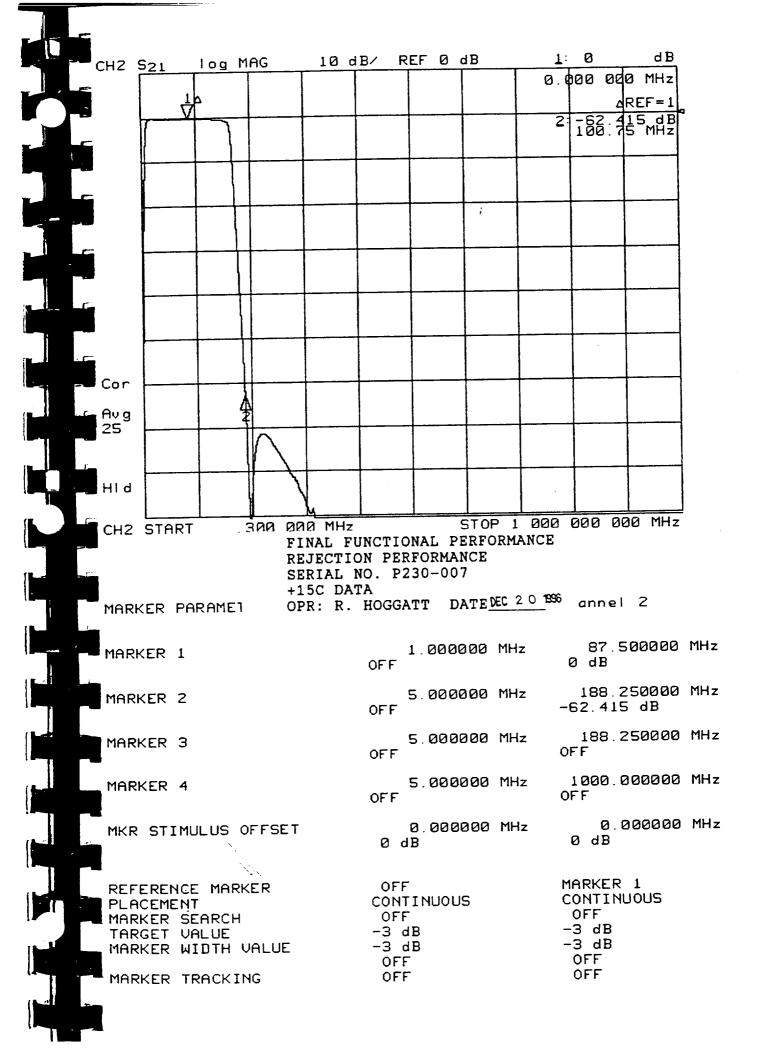
3.250

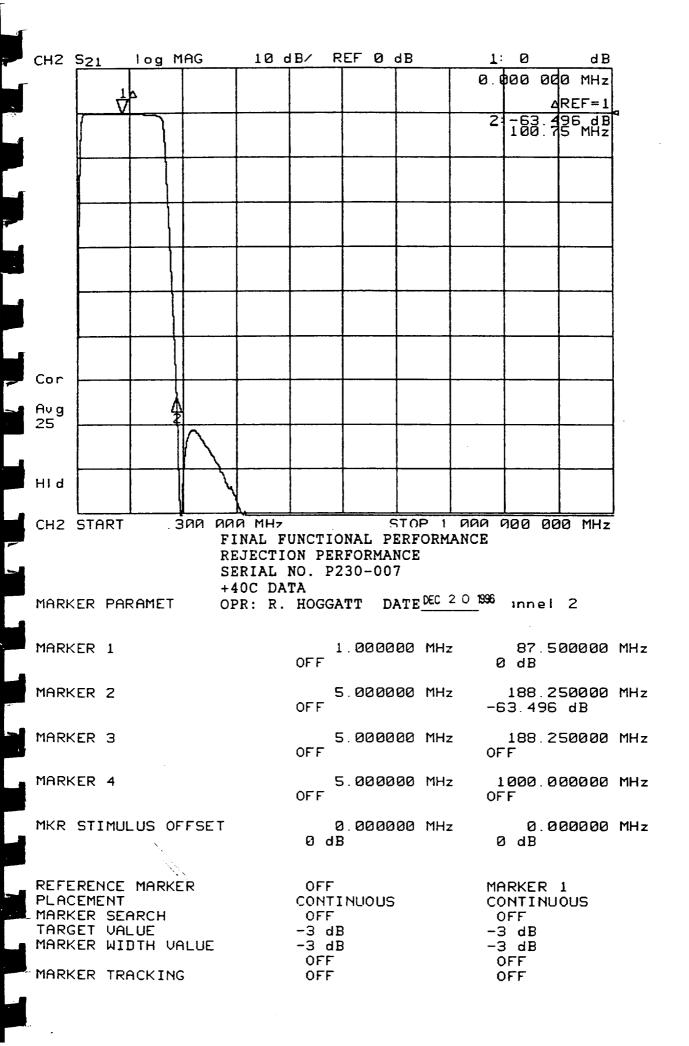
3.250

Prepared in accordance with MIL-STD-100

CONTRACT NO.	SIZE	CAGE CODE	DWG.		REV	7.
	Α	57032	63-000	05-02	J	_
DADEN-ANTHONY ASSOCIATES INC.	FILE: ACAD/63/0502APDJ.DOC			SHEET	13	

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Av g 25		7									
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HId			-								
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					10. FZ	30-00	7				
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MARK MARK MARK	ER 1 ER 2 ER 3		OP		OFF  OFF	TT D 0000 5. 0000 6. 0000	ATE DEC 2 100 MHz 100 MHz 100 MHz	-6 OF 0F	87.5 dB 188.2 1.496 188.2 F 000.0	00000 50000 dB 50000	MH MH
MARK MARK MARK	ER 1 ER 2 ER 3 ER 4		OP		OFF  OFF	TT D 0000 5. 0000 6. 0000	ATE DEC 2	-6 OF 0F	87.5 dB 188.2 1.496 188.2 F 000.0	00000 50000 dB 50000	MH MH
MARK MARK MARK MARK MKR	ER 1 ER 2 ER 3 ER 4 STIMULU	US OFF	OP FSE T		OFF	TT D 0000 5. 0000 6. 0000	ATE DEC 2 100 MHz 100 MHz 100 MHz 100 MHz	-6 OF 1 OF Ø	87.5 dB 188.2 1.496 188.2 F 000.0 F 0.0 dB	90000 50000 dB 50000 00000	мн мн
MARK MARK MARK MKR REFE PLAC MARK	ER 1 ER 2 ER 3 ER 4 STIMULL RENCE 1 EMENT ER SEAF	US OFF MARKEF	OP FSE T		OFF OFF OFF OFF OFF OFF	TT D	ATE DEC 2 100 MHz 100 MHz 100 MHz 100 MHz	-6 0F 1 0F Ø MA CO 0	87.5 dB 188.2 1.496 188.2 F 000.0 F 0.0 dB RKER NTINU	90000 50000 dB 50000 00000	мн мн
MARK MARK MARK MKR REFE PLAC MARK TARG	ER 1 ER 2 ER 3 ER 4 STIMULU RENCE 1	US OFF MARKEF RCH JE	OP SET		OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF	TT D 0000 5. 0000 6. 0000 6. 0000	ATE DEC 2 100 MHz 100 MHz 100 MHz 100 MHz	-6 0F 0F 0F 0A 00 -3 -3	87.5 dB 188.2 1.496 188.2 F 000.0 dB RKER NTIN FdB dB	90000 50000 dB 50000 00000	MH MH
MARK MARK MARK MARK MKR REFE PLAC MARK TARG MARK	ER 1 ER 2 ER 3 ER 4 STIMULL RENCE N EMENT ER SEAF	US OFF MARKEF RCH JE TH VAL	OP SET		OFF OFF OFF OFF OFF OFF OFF OFF OFF	TT D 0000 5. 0000 6. 0000 6. 0000	ATE DEC 2 100 MHz 100 MHz 100 MHz 100 MHz	-6 OF OF 0F 0A -3 -3	87.5 dB 188.2 1.496 188.2 F 000.0 F 0.0 dB RKER NTINU FF	90000 50000 dB 50000 00000	MH MH





# **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230 - 007 AEROJET 1331559-4 REV. E

#### **BANDPASS CHARACTERISTICS MEASUREMENT**

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +23.6 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

**✓**(√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE		
F1	0.5	MHz	<u>- ४५.५ </u> dB	F11	(*) 100.0	MHz	-0.26 dB		
F2	1.0	MHz	<u>- 67.7_</u> dВ	F12	(*) 125.0	MHz	-0.35 dB		
F3	5.0	MHz	<u>- 18.6</u> dB	F13	150.0	MHz	- <u>८,५८</u> dB		
F4	7.5	MHz	<u>-7.72</u> dB	F14	160.0	MHz	-1.06 dB		
F5	10.0	MHz	<u>-1.87</u> dB	F15	165.0	MHz	- <u>4.29</u> dB		
F6	15.0	MHz	-0.24 dB	F16	170.0	MHz	- <u>15.5</u> dB		
F7	25.0	MHz	<u>-0.13</u> dB	F17	200.0	MHz	<u>-84.8</u> dB		
F8	(*) 50.0	MHz	<u>-0.18</u> dB	F18	300.0	MHz	-87.5 dB		
F9	(*) 75.0	MHz	<u>-0,22</u> dB	F19	500.0	MHz	-106.6 dB		
F10	87.5	MHz	-0.77 dB	DA F20	1000.0	MHz	-161.2 dB		
TEST	TEST PERFORMED BY: R. HOGGAT DATE 12/20/96								

NOTE IF TEST WITNESSED BY AESD\_\_\_\_ Not witnessed this time. DLD \_\_\_\_\_

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

#### **FUNCTIONAL PERFORMANCE TEST**

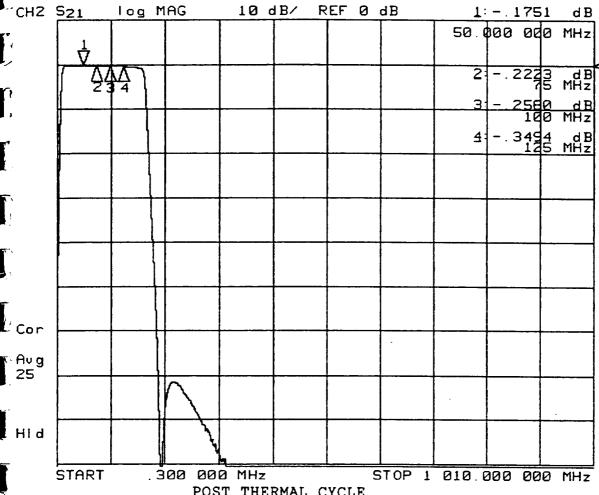
ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX D PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- b.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- c.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.
- d) INSERTION LOSS PER ATP PARA 4.5.2
- e) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- q.) VSWR PER ATP PARA 4.5.1.

Prepared in accordance with MIL-STD-100

CONTRACT NO.			DWG. NO.	RE	V.	
	Α	57032	(	63-0005-02	.	J
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APDJ.DOC		SHEET	10	



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P230-007
AMBIENT

MARKER PARAME

OPR: R. HOGGATT DATE DEC 2 0 1996 January 2

17.750000 MHz	50.000000 MHz
OFF	1751 dB
157.250000 MHz	75.000000 MHz
OFF	2223 dB
29.375000 MHz	100.000000 MHz
OFF	2560 dB
145.625000 MHz	125.000000 MHz
OFF	3494 dB
0.000000 MHz	89.425802 MHz
0 dB	-3.2342 dB
OFF CONTINUOUS OFF -14 dB -3 dB OFF OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF
	0FF     157.250000 MHz 0FF     29.375000 MHz 0FF     145.625000 MHz 0FF     0.000000 MHz 0 dB  0FF CONTINUOUS 0FF -14 dB -3 dB 0FF

# **Channel 9 Bandpass Filter**

IF Filter (S/N: 1331559-4, S/N: P230-013)

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		•		
 APPENDIX D ACCEP	TANC	E TEST REPOR	I	
BANDPASS FILTER MODEL HL87.5-155- AEROJET 1331559-4 REV.	-10SS	1 S/N <u>P230</u> -	013	
 3.0 dB BANDWIDTH ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	•	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	(	1 <u>64.51</u> MHz (163.0-165.0)	<u>164.22</u> Mhz (163.0-165.0)	16 <u>3.96</u> MHz (163.0-165.0)
(8) LOWER 3.0 dB BANDEDGE	(	9.17 MHz (8.0-10.0)	<u>9.(</u> Mhz (8.0-10.0)	<u>9.14 </u> MHz (8.0-10.0)
(9) 3.0 dB RELATIVE BANDWIDTH	. (	1 <u>55.34</u> MHz 153.0-157.0)	<u>55.0</u> 6Mhz (153.0-157.0)	<u>54.82 </u> MHz (153.0-157.0)
{10} ADD {7} AND {8} ÷ 2 =	(	<u>86.84</u> MHz 87.5 NOM)	<u>%.69</u> MHz (87.5 NOM)	8 <u>6.55</u> Mhz (87.5 NOM)
{10a} RECORD MEASURED TEMPERATION		- <u>17.7</u> °C (-15.0 TO -10.0)		+ <u>43 · /</u> °C (40.0 TO 45.0)
(6) ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT		<u>/</u> (1)	<u> </u>	<u>~</u> (1)
PASSBAND RIPPLE ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	٠	-10°C	+15°C	+40°C
(11a) MIN INSERTION LOSS FREQ		19.27 MHz	1927 Mhz	19.27 MHz
MIN INSERTION LOSS PERFORM	IANCE	- <u>0.10</u> dB	- <u>O.IO_</u> dB	-0.10 dB
{11b} 75% BW LOWER BANDEDGE FRE	Q.	13.21 MHz	13.08 Mhz	1 <u>2.94</u> MHz
75% BW LOWER BANDEDGE I.L.	PERF	- <u>0.35</u> dB	- <u>0.37</u> dB	- <u>039_</u> dB
{11c} 75% BW UPPER BANDEDGE FRE	Q	1 <u>29.46</u> MHz	129.33Mhz	12 <u>9 19 MHz</u>
75% BW UPPER BANDEDGE I.L. I	PERF	- <u>0.35</u> dB	- <u>0.37</u> dB	- <u>0.39</u> dB

Prepared in accordance with MIL-STD-100				
CONTRACT NO.	SIZE A	CAGE CODE <b>57032</b>	DWG. NO. <b>63-0005-02</b>	REV.
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APDJ.DOC	SHEET	12

{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})

(I.L. @ {11c} - I.L. @ {11a})

{11e} PERFORMANCE DELTA

0.25dB

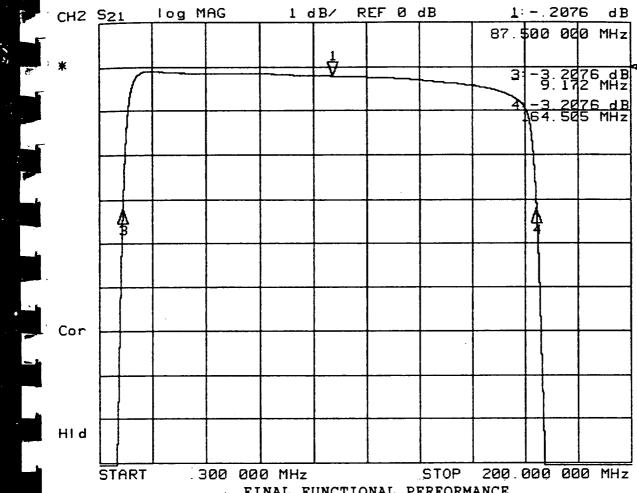
0.25<sub>dB</sub>

0.27 dB

0.27 dB

<u>0.29</u> dB

0.29 dB

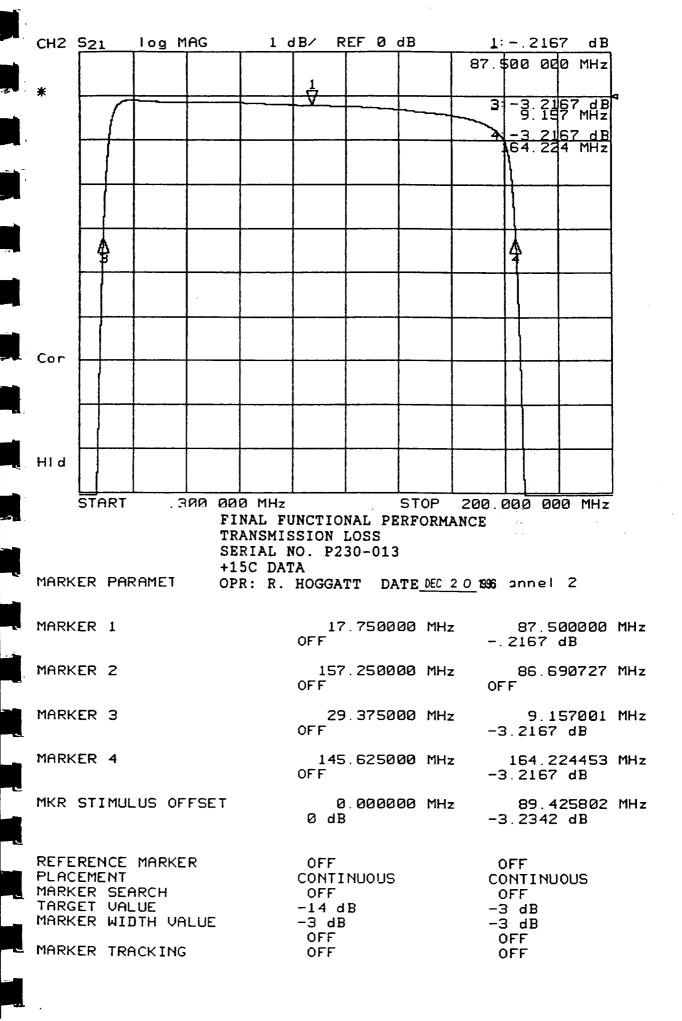


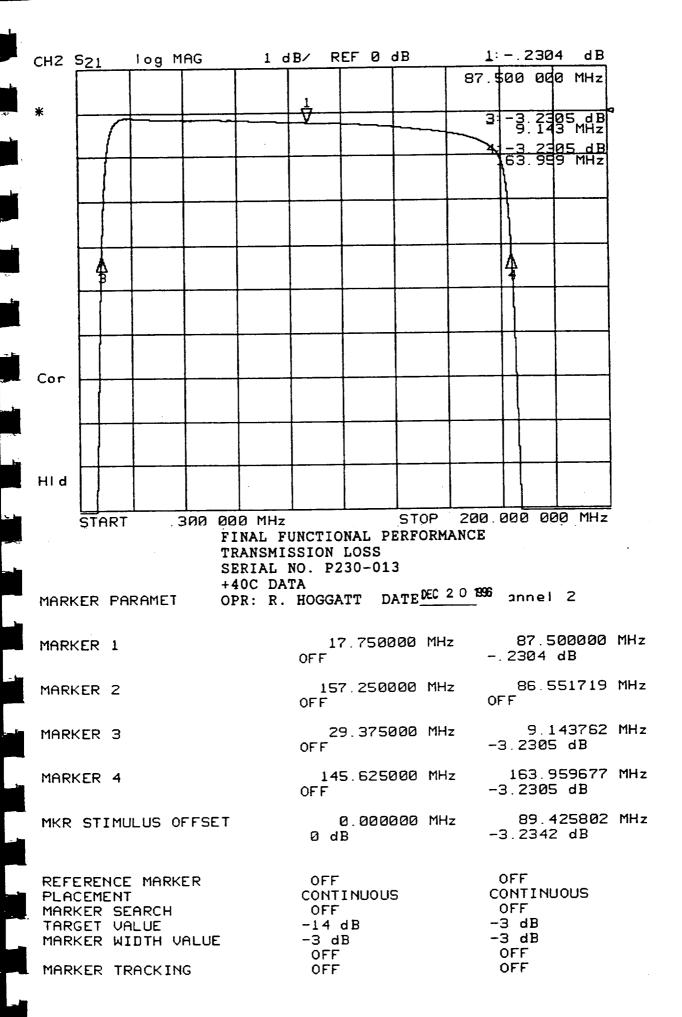
FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P230-013

-10C DATA

OPR: R. HOGGATT DATE DEC 2 0 1996 annel 2 MARKER PARAMET

MARKER 1	17.750000 MHz OFF	87.500000 MHz 2076 dB
MARKER 2	157.250000 MHz OFF	86.838840 MHz OFF
MARKER 3	29.375000 MHz OFF	9.172203 MHz -3.2076 dB
MARKER 4	145.625000 MHz OFF	164.505477 MHz -3.2076 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE MARKER TRACKING	OFF CONTINUOUS OFF -14 dB -3 dB OFF OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF





# **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-013 AEROJET 1331559-4 REV. E

## PASSBAND RIPPLE (CON'T)

₹11B	RECORD PASS/FAIL	(0.5 dB MAX)
1	11200110 : 7100117112	(0.0 40 0.9

PASS)FAIL

(11g) ATTACH PASSBAND RIPPLE

PERFORMANCE X-Y PLOT(S)

#### **OUT-OF-BAND REJECTION**

ACCEPTANCE TEST PROCEDURE

-10°C

+15°C

+40°C

63-0005-02 PARA 4.5.5

Fc=87.5 MHz.

REF (5A) FOR INSERTION LOSS @ Fc

{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz

*-60,6*dB (40.0 dB MIN) -<u>60.5</u>dB (40.0 dB MIN) -60.5 dB(40.0 dB MIN)

{13a} WORST CASE REJECTION FROM 188.25 MHz TO 1000.0 MHz

-<u>63.5</u>dB (40.0 dB MIN)

-<u>64.5</u> dB (40.0 dB MIN) (40.0 dB MIN)

-65.5 dB

{13c} RECORD MEASURED TEMPERATURE -12.6 °C

(-15.0 TO -10.0) (12.5 TO 17.5)

+15.1 °C

+43.0°C (40.0 TO 45.0)

**{14} ATTACH REJECTION PERFORMANCE** X-Y PLOT(S)

TEST PERFORMED BY 12 HOGGATE DATE 12/20/96

NOTE IF TEST WITNESSED BY AESD: \_\_\_\_\_ GSI: This time. DLD

Not witnessed

\*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\*

# **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION**

{16} REFERENCE CUSTOMER DRAWING 1331559

**DESCRIPTION OF MEASUREMENT** 

DIMENSION AND TOLERANCE

ACTUAL **MEASUREMENT** 

3.50 + .03

**OVER ALL LENGTH** 

3.503

**MOUNTING HOLE CENTER** 

 $0.125 \pm .010$ 

0.128

BETWEEN UPPER MOUNTING HOLES

3.250

2750

**BETWEEN LOWER MOUNTING HOLES** 

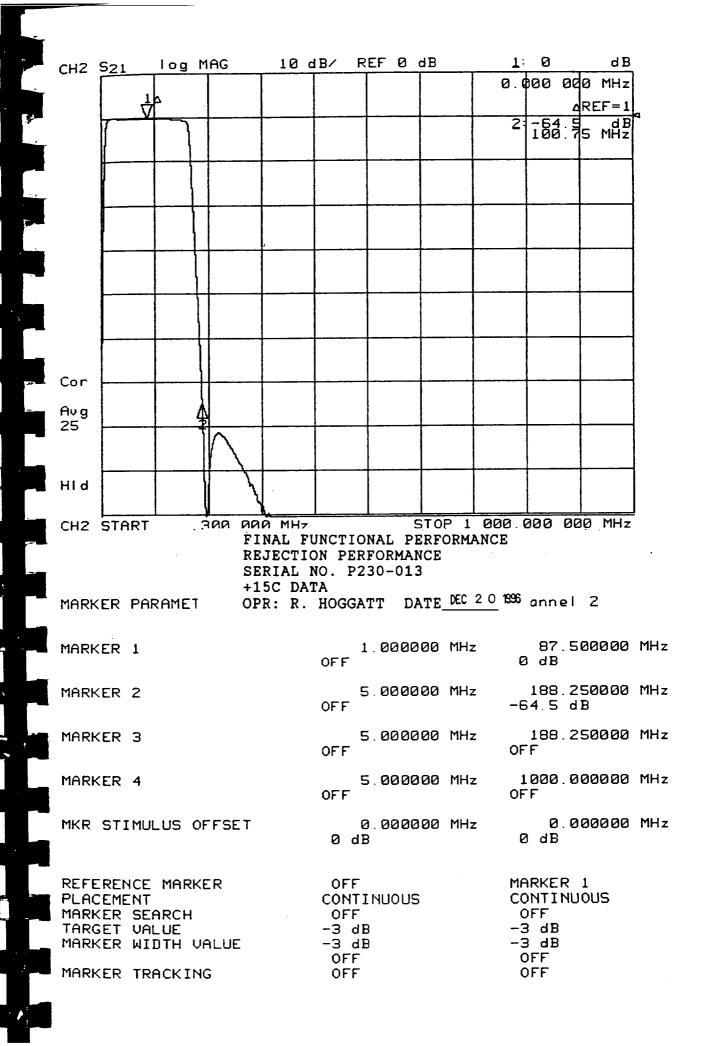
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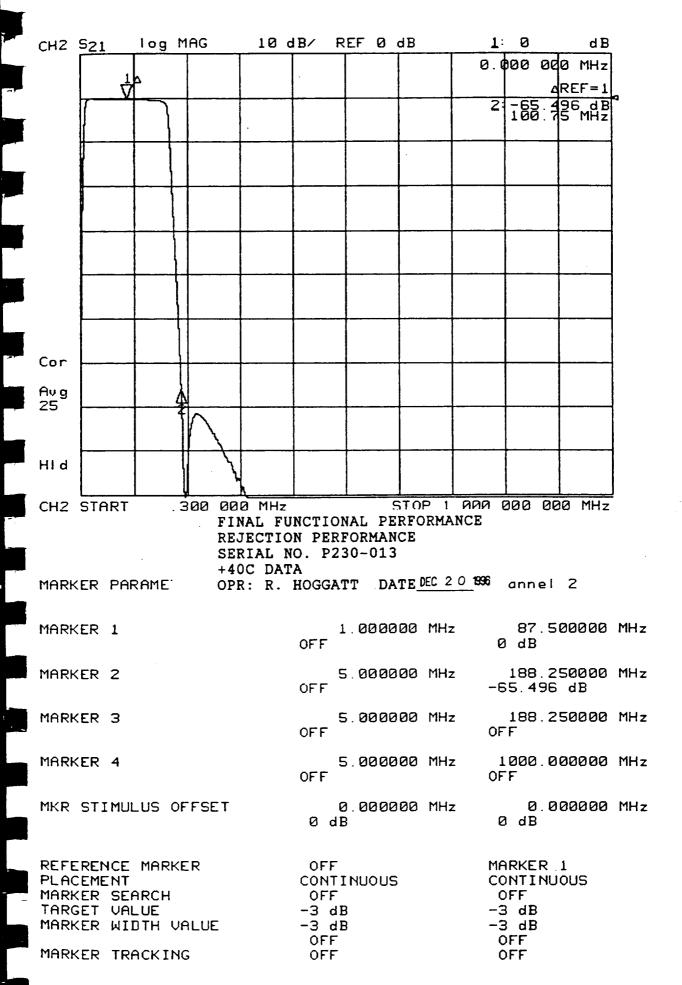
3.250

Prepared in accordance with MIL-STD-100

CONTRACT NO.	SIZE A	CAGE CODE <b>57032</b>	DWG. NO. <b>63-0005-02</b>	REV.
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APDJ.DOC	SHEET	13

CH2	S <sub>21</sub>	log	MAG	10 d	B/	REF 0	dB	1:	0	d B	
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•											
MARK	KER 2				OFF	5.000	000 MH		188.2 33.52	250000	MHz
					OFF						
MARK	KER 3				٥٣٢	5.000	000 MH		188.2 F	250000	MHz
					OFF						
MARK	KER 4					5.000	000 MH		1000.( F	300000	MHz
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					. <del></del> .				201/55	•	
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PLAC MARK	CEMENT KER SE	ARCH			CONT OFF	INUOU		C	ONTINI OFF		
PLAC MARK TARC	CEMENT KER SE GET VA	ARCH LUE			CONT OFF	INUOU B		C( -:	ONTINO OFF 3 dB		
PLAC MARK TARG MARK	CEMENT KER SE	ARCH LUE DTH	VALUE		CONT OFF	INUOU B B		C( -: -:	ONTINI OFF		





#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N <u>P230</u>-013 AEROJET 1331559-4 REV. E

## **BANDPASS CHARACTERISTICS MEASUREMENT**

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +27.3 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

<u>/</u>(1)

**{24} TEST POINT MATRIX** 

REF	FREQ	UNIT	VALUE		REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-83,9 dB	•	F11	(*) 100.0	MHz	-0.24 dB
F2	1.0	MHz	<u>-67.5 dB</u>		F12	(*) 125.0	MHz	- 0.33 dB
F3	5.0	MHz	<u>-18.7 dB</u>		F13	150.0	MHz	-0.58 dB
F4	7.5	MHz	<u>- 7.70 dB</u>		F14	160.0	MHz	-1.02 dB
F5	10.0	MHz	<u>-1.80</u> dB		F15	165.0	MHz	-4.34 dB
F6	15.0	MHz	-0.21 dB		F16	170.0	MHz	-16.1 dB
F7	25.0	MHz	<u>-0.11</u> dB		F17	200.0	MHz	-83.2 dB
F8	(*) 50.0	MHz	dB <u>ما ۱۰-</u>		F18	300.0	MHz	- <u>87.7</u> dB
F9	(*) 75.0	MHz	-0.20 dB		F19	500.0	MHz	- 107.7 dB
F10	87.5	MHz	- <u>0.76</u> dB		F20	1000.0	MHz	-105.3 dB

TEST PERFORMED BY: 12 HOGGATI 5 DATE 12/20/96

NOTE IF TEST WITNESSED BY AESD\_\_\_\_\_ GS

GSI Not witnessed this time. DLD

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

#### **FUNCTIONAL PERFORMANCE TEST**

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX D PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- b.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- c.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.
- d) INSERTION LOSS PER ATP PARA 4.5.2
- e) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) VSWR PER ATP PARA 4.5.1.

Prepared in accordance with MIL-STD-100				
CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.
	Α	57032	63-0005-02	J
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APDJ.DOC	SHEET	10

сн2	S <sub>21</sub>	log	MAG	10 c	B/ R	EF 0	dB	1:	160	14 dB	
	1							50.0	00 00	0 MHz	
	$\sqrt{N}$							2:	203	8 dB 5 MHz	4
	23	34						3:	- 241	8 dB	
								4:	10	0 MHz	
	<b></b>							Ξ.	333 12	6 dB 5 MHz	
		-									
Cor	ļ										
Av g											
25											
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HId	İ										
	START			Ø MHz	17141		TOP 1	010.6	200 00	Ø MHz	!
			PA	SSBAND		ACTERI					
			AM1	BIENT		30-013					
MARK	ER PAI	RAMEI	OPI	R: R.	HOGGA'	TT DA	TE_DEC 2	O 1395	annel	2	
MARK	ER 1				17 OFF	'.7500	00 MHz	<b>.</b> 	50.0 1604	00000 dB	MHz
MARK	ER 2				17.750000 MHz 50.000000 MH OFF1604 dB 157.250000 MHz 75.000000 MH						
					OFF			<b>-</b> .	2038	dB	
MARK	ER 3				OFF	3750	00 MHz	<b>z</b> 	100.0 2418		MHz
MARK	CER 4				145 OFF	5.6250	00 MHz		125.0 3336		MHz
MKR	STIMU	LUS O	FFSET		O dE	).0000 }	00 MHz	z -3	89.4 3.2342	25802 dB	MHz
PLAC MARK TARG	RENCE CEMENT (ER SEI GET VAI	ARCH LUE				Β		CC C -3	PFF PMTIMU PFF B dB	ous	

-3 dB

OFF

OFF

-3 dB

OFF

OFF

MARKER WIDTH VALUE

MARKER TRACKING

# **Channel 10 Bandpass Filter**

IF Filter (S/N: 1331559-7, S/N: P233-004)

			· <del></del>
			- Lat

		•		
	APPENDIX G ACCEPTAN	CE TEST REPOR	RI	
	BANDPASS FILTER MODEL FX217-78-10SS1 AEROJET 1331559-7 REV.	1 S/N <u>P233</u> -C	¥0×	
	3.0 dB BANDWIDTH ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	. +15°C	+40°C
	(7) UPPER 3.0 dB BANDEDGE	2 <u>55.40</u> MHz (254.0 <b>-256.0)</b>	2 <u>55.32</u> Mhz (254.0-256.0)	25 <u>4.94 MHz</u> (254.0-256.0)
	(8) LOWER 3 0 dB BANDEDGE	17 <u>9.50</u> MHz (178.0-180.0)	( <u>79.34</u> Mhz ( <u>1</u> 78.0-180.0)	17 <u>9.17</u> MHz (178.0-180.0)
	(9) 3.0 dB RELATIVE BANDWIDTH	<u>76.10</u> MHz (74.0-78.0)	75.98 Mhz (74.0-78.0)	7 <u>5.77</u> MHz (74.0-78.0)
	<b>{10}</b> ADD <b>{7}</b> AND <b>{8}</b> ∞ 2 =	2 <u>17.55</u> MHz (217.0 NOM)	2 <u>17.33</u> MHz (217.0 NOM)	7 <u>17.06</u> Mhz (217.0 NOM)
	{10a} RECORD MEASURED TEMPERATURE	- <u>17 . 1</u> °C (-15.0 TO -10.0)	+ <u>  4.6</u> °C (12.5 TO 17.5)	+ <u>43.3</u> °C (40.0 TO 45.0)
	(6) ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	<u> </u>	(\forall )	(\forall )
·*	PASSBAND RIPPLE ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5 4	-10°C	+15°C	+40°C
	(11a) MALENSERTION LOSS FREQ	211.65MHz	211.05 Mhz	213.50MHz
	MIN INSERTION LOSS PERFORMANC	E - <u>0.57</u> dB	- <u>0,60</u> db	- <u>0,63</u> dB
	{11b} 75% BW LOWER BANDEDGE FREQ	1 <u>86.60</u> MHz	1 <u>86.40</u> Mhz	1 <u>86.22</u> MHz
	75% BW LOWER BANDEDGE I.L. PERF	- <u>0.98</u> dB	- <u>1.04</u> dB	- <u>1.10</u> dB
	(11c) 75% BW UPPER BANDEDGE FREQ	2 <u>45.10 m</u> Hz	7 <u>44.90</u> Mhz	2 <u>44.72</u> MHz
	75% BW UPPER BANDEDGE I.L. PERF	- <u>0.98</u> dB	- <u>1.04</u> dB	- <u>1.10</u> dB
	{11d} PERFORMANCE DELTA	<u>0.41</u> dB	0.44 dB	0.47 dB

Prepared in accordance with MIL-STD-	160			
CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.
	Α	57032	63-0005-02	J
DADEN-ANTHONY ASSO	CI.ATES INC. FILE: AC	AD/63/0502APGJ.DOC	SHEET	12

0.41 dB

0.44 dB

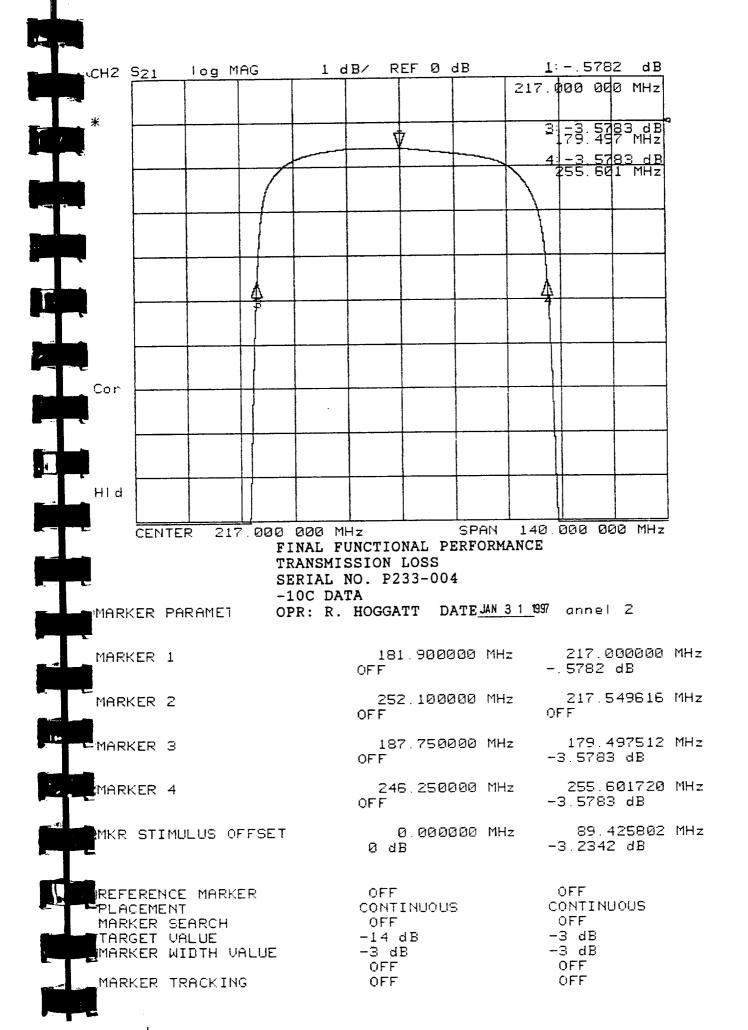
0.47 dB

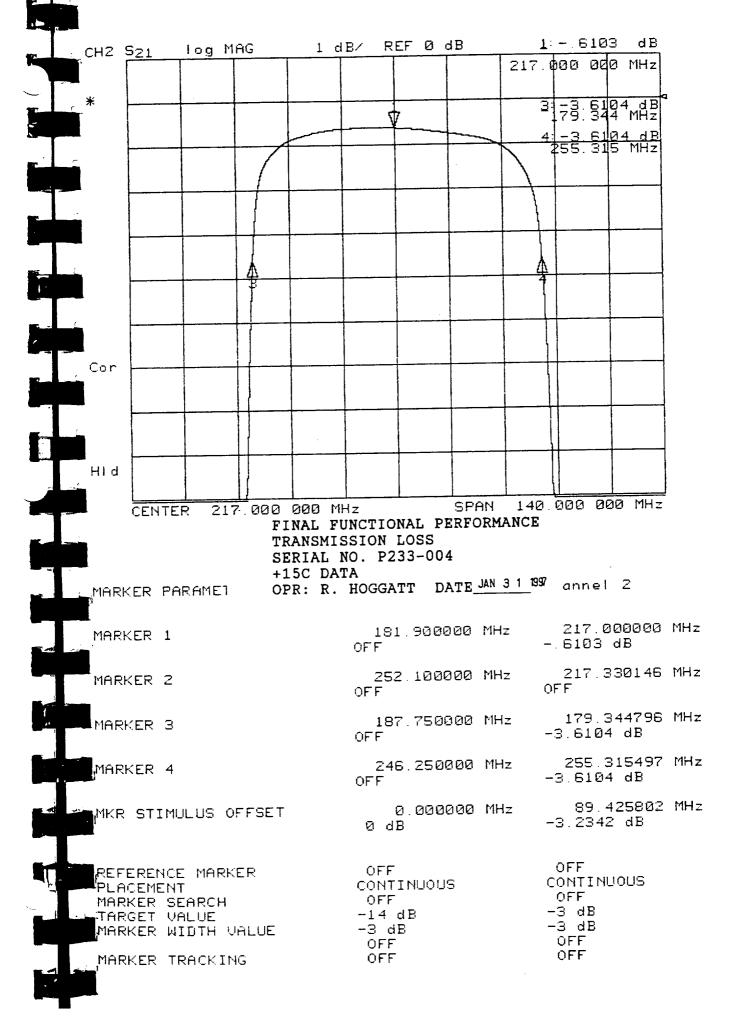
li

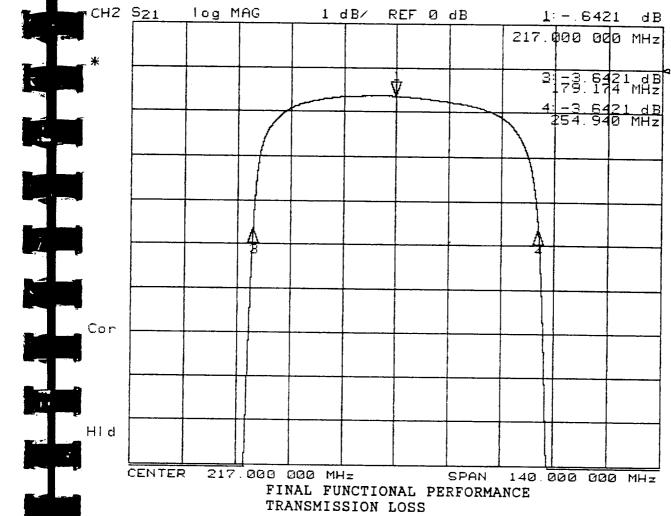
(I.L. @ {11b} - I.L. @ {11a})

(LL @ {11c} - LL @ {11a})

{11e} PERFORMANCE DELTA







SERIAL NO. P233-004

+40C DATA

MARKER TRACKING

MARKER PARAMET OPR: R. HOGGATT DATE JAN 3 1 1997 annel 2

- p		
MARKER 1	181.900000 MHz OFF	217.000000 MHz 6421 dB
MARKER 2	252.100000 MHz OFF	217.057616 MHz OFF
MARKER 3	187.750000 MHz OFF	179.174428 MHz -3.6421 dB
MARKER 4	246.250000 MHz OFF	254.940804 MHz -3.6421 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -14 dB -3 dB OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF

OFF

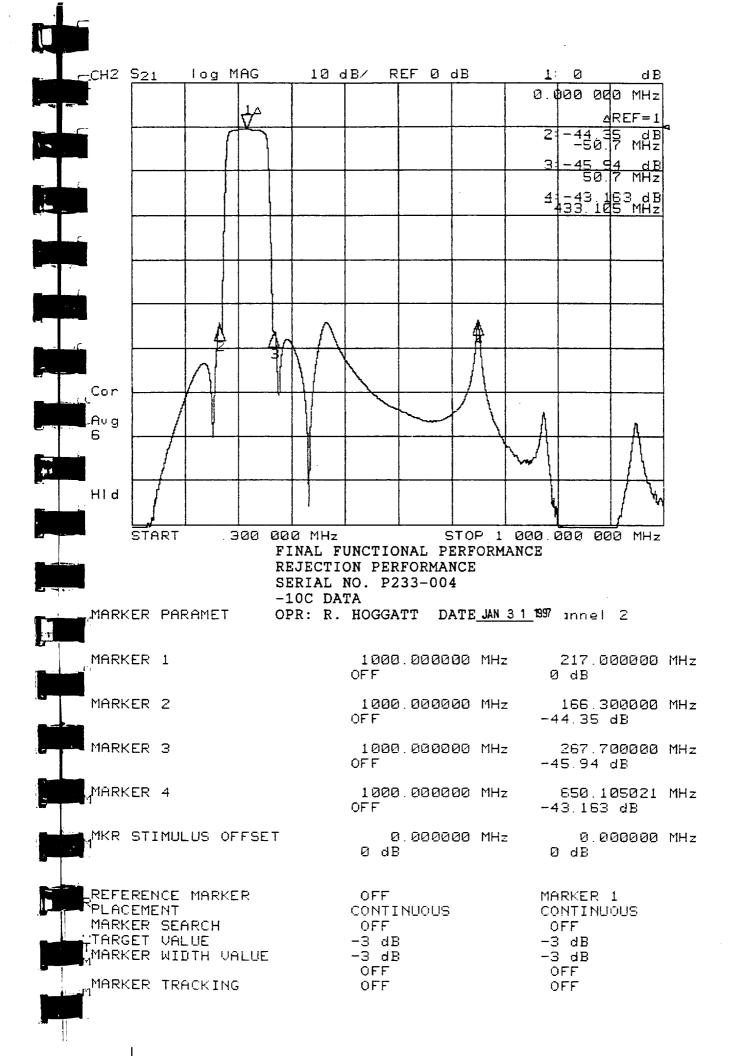
OFF

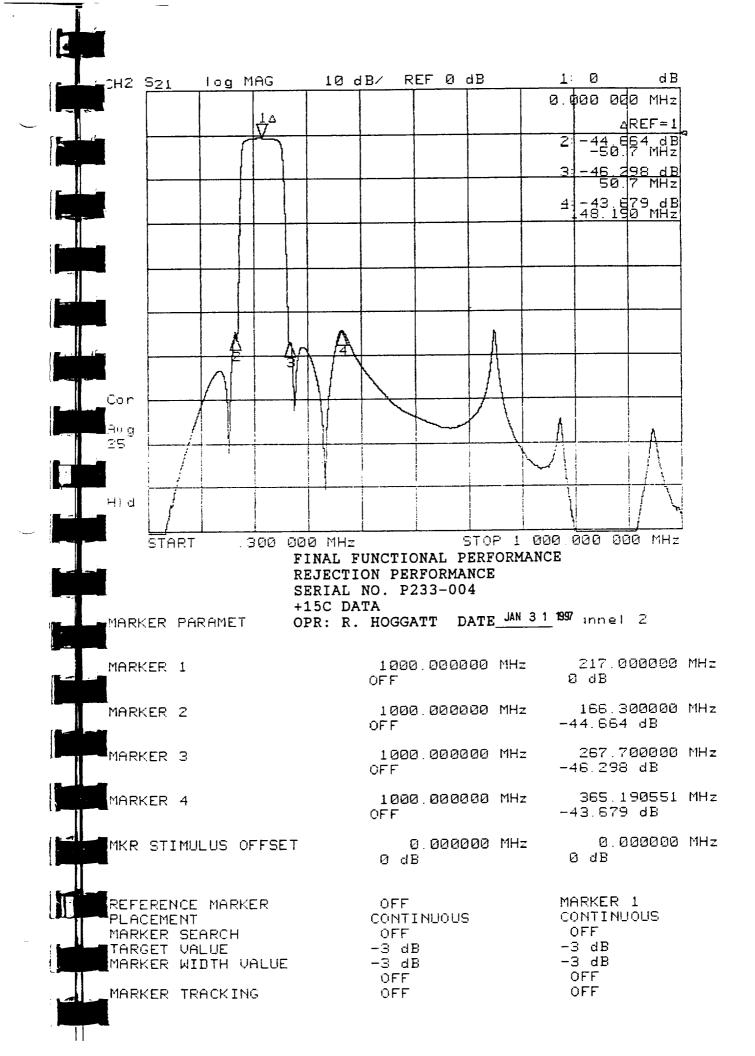
### APPENDIX G **ACCEPTANCE TEST REPORT** BANDPASS FILTER MODEL EX217-78-10SS1 S/N P233-004 AEROJET 1331559-7 REV. | PASSEAND RIPPLE (CON'T) {11f} RECORD PASS/FAIL (0.7 dB MAX) (PASS/FAIL (PASS)FAIL (11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S) **OUT-OF-BAND REJECTION** ACCEPTANCE TEST PROCEDURE -10°C +15°C +40°C 63-0005-02 PARA 4.5 5 Fc=217.0 MHz. REF (5A) FOR INSERTION LOSS @ Fc {12} WORST CASE REJECTION FROM -43.8 dB -43.9 dB -44.1 dB 0.300 MHz TO 166.3 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) -43.7 dB -43.6 dB -43.2 dB {13a} WORST CASE REJECTION FROM 267.7 MHz TO 1000.0 MHz (40.0 dB MIN) (40.0 dB MIN) (40.0 dB MIN) +43.3 ℃ {13c} RECORD MEASURED TEMPERATURE -12.3 ℃ +14.6°C (-15.0 TO -10.0) (12.5 TO 17.5) (40.0 TO 45.0) {14} ATTACH REJECTION PERFORMANCE X-Y PLOT S. TEST PERFORMED BY 12. HOGGATT DATE 1/31/97 NOTE IF TEST WITNESSED BY AESD: \_\_\_\_\_ GSI: Not Witnessed this time. DLD \*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\* **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION** {16} REFERENCE CUSTOMER DRAWING 1331559 **DESCRIPTION OF** DIMENSION AND ACTUAL MEASUREMENT TOLERANCE **MEASUREMENT OVER ALL LENGTH** $5.50 \pm .03$ MOUNTING HOLE CENTER 0.125 + .010BETWEEN UPPER MOUNTING HOLES 5.250 5.246 BETWEEN LOWER MOUNTING HOLES 5.250 Prepared in accordance with MIL-STD-100 **CONTRACT NO.** SIZE I CAGE CODE DWG. NO. REV. 57032 63-0005-02

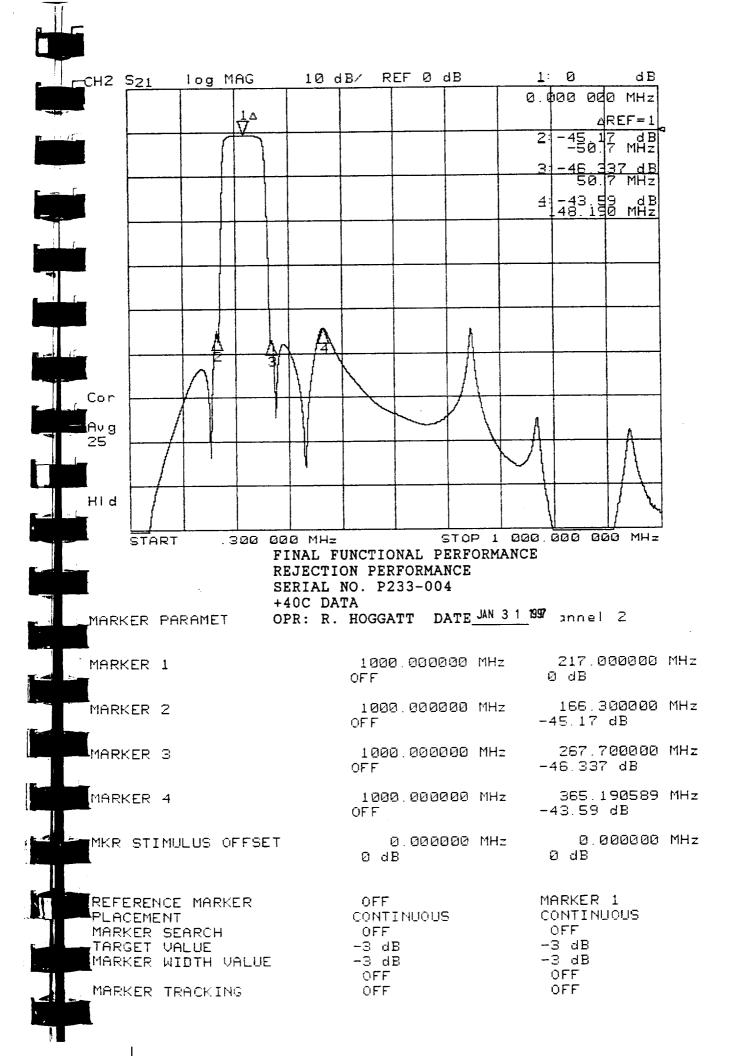
SHEET

13

DADEN-ANTHONY ASSOCIATES INC. FILE: ACAD/63/0502APGJ.DOC







AP	Р	Ε	N	DI	X	G

# **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL FX217-78-10SS1 S/N <u>P233 - 004</u> AEROJET 1331559-7 REV. E

# BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +24.4 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	1.0	MHz	-102.4 dB	F11	217.0	MHz	- <u>0.60</u> dB
F2	10.0	MHz	- <u>107.1</u> dB	F12	(*) 224.0	MHz	-0.64 dB
F3	100.0	MHz	<u>-61.6</u> dВ	F13	(*) 230.0	MHz	-0.69 dB
F4	150.0	MHz	<u>-61.3</u> dB	F14	240.0	MHz	-0.87 dB
F5	170.0	MHz	<u>-46.3</u> dB	F15	250.0	MHz	-1.51 dB
<b>F</b> 6	178.0	MHz	<u>-7.33</u> dB	F16	256.0	MHz	-5.79 dB
<b>F</b> 7	184.0	MHz	<u>~ 1,35</u> dB	F17	264.0	MHz	-39.3 dB
F8	194.0	MHz	<u>-0.75</u> dB	F18	300.0	MHz	-49.1 dB
F9	(*) 204.0	MHz	- <u>0,63</u> dB	F19	500.0	MHz	-63.9 dB
F10	(*) 210.0	MHz	- <u>0.59</u> dB	F20	1000.0	MHz	-86.5 dB
			$\overline{}$		1 1	_	

TEST PERFORMED BY: R. HOSGATT DATE 131/97

NOTE IF TEST WITNESSED BY AESD GSI

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\*

Not Witnessed this time. DLD

# **FUNCTIONAL PERFORMANCE TEST**

ACCEPTANCE TEST PROCEDURE

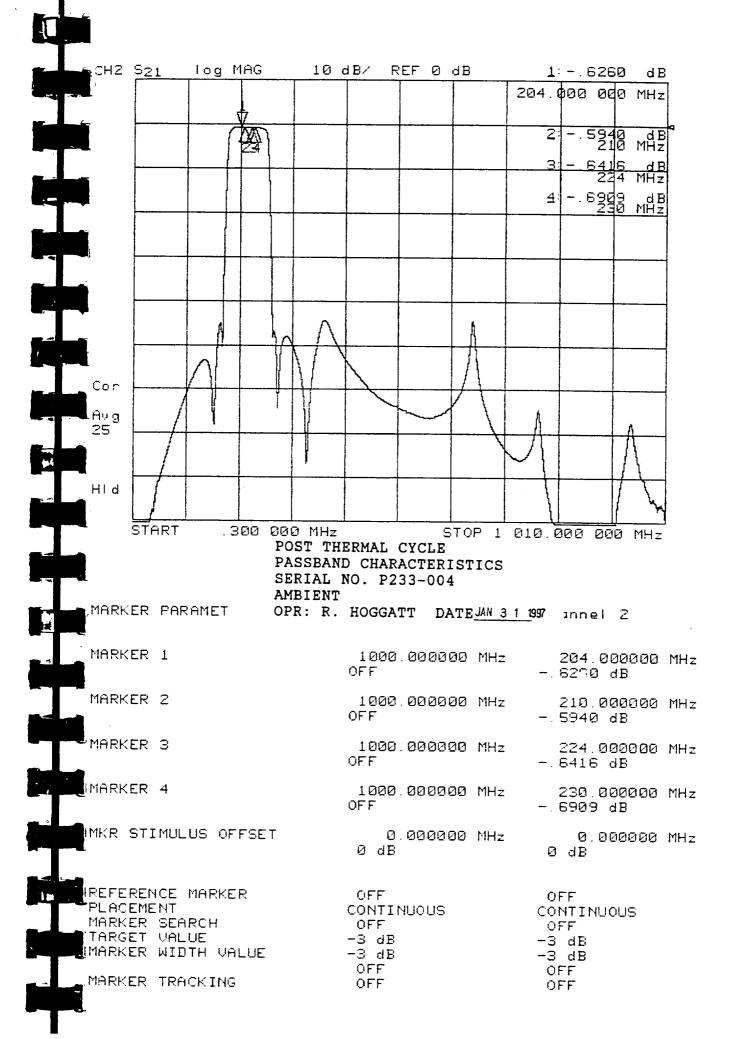
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX G PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

 Prepared in accordance with MIL-STD-100

 CONTRACT NO.
 SIZE A STO32
 CAGE CODE A STO32
 DWG. NO. BEV. BEV. BEV. BEV. BLE: ACAD-92.053/2APGJ.DOC
 DWG. NO. BEV. BEV. BEV. BEV. BLE: ACAD-92.053/2APGJ.DOC
 SHEET
 10



# **Channel 11 Bandpass Filter**

SAW Filter (S/N: 1331576-1, S/N: B03)

### ELECTRICAL TEST DATA SHEET

	מבתחובד ב		LECTRICAL TEST DATA		03 CE			
			31576-1 PHONON PA					
			TITLE: jaj	DHIE:	11 /2-	/ 3/ 11ME	- 100 2001	
			TIONAL					
	EQUIPMENT							
		HP 34	78A SERIAL: <u>2136</u>	A03127	CAL	. DUE: <u>7/7</u>	/98	
	565665	ABI I	SECULOCUEUR TITLE			BOTO		D /F
	PARAGA REQ.	מדמ/מ מרמ/מ	REQUIREMENT TITLE			DATA		P/F
			OPERATING TEMPERAT	IRF		-4.7	r	Р
	3.2.1.3	5.2.3	CENTER FREQUENCY &				. •	÷
	3.2.1.4		CENTER FREQUENCY S					
			LO: 273.335/275.06			274.835	MH-7	D
			HI: 369.335/371.06			370.858	•	<u>p</u>
	7215	524	3 dB BANDWIDTH:	J 1412		316.030	, Fi 12	<u>-</u> -
	J. L. 1. J	U. L. 7	LO: 34/36 MHz			34.963	MU-	D
			HI: 34/36 MHz			35.341		p p
	7216	525	PASSBAND SYMMETRY			33.371	, PIOZ	
	3. 2. 1. 0	J. E. J	LO: /0.5 dB			0.4	dB	Ð
			HI: /0.5 dB			0.3		P
	3217	526	PASSBAND RIPPLE			0.0	, ub	<u>-</u>
	J. L. I. f	J. L. U	260.7-287.7 MHz: /:	1 0 dB		0.6	dВ	D
			356.7-383.7 MHz: /			0.5		<u>р</u> <u>Р</u>
	7210	527	INSERTION LOSS	1.0 00			55	<u>-</u>
	3. 6. 1. 0	J. E. 7	LO: 27.8/30.2 dB			28.4	42	D
			HI: 27.8/30.2 dB			28.5		<u>Р</u>
	7210	520	INSERTION LOSS VAR	TATTOM		<u> </u>	OB	
_	3. 6. 1. 3	J. C. D	LD: -0.4/0.4 dB	IHIION		-0.1	dВ	D
_			HI: -0.4/0.4 dB			0.1	dB	P
	3.2 1 10						0.0	<u> </u>
	0. 2. 1. 10	J. L. J	AMPLITUDE BALANCE LO,HI: /0.5 dB			0.1	dВ	P
			OUT-OF-BAND REJECT:					<u> </u>
	0.0	0.2.10	BAND		PEAK (d	B) W	IDTH(MHz)	
			WIDE: 1-225, 420-100				0.000	
			DUAL: 225.000-249.9					
			298.465-345.9	-				
			394.465-420.6		42.4		0.000	
			PEAK: 35.0/ dB		42.4			<u>P</u>
			WIDTH: /7.2 MHz				0.000 MHz	P
	3.2.1.12	5.2.11	SHAPE FACTOR					
			LD: /1.30 Unitle	255		1.30	Unitless	$\frac{p}{p}$
			HI: /1.30 Unitle	255		1.26	Unitless	P
	3.2.1.14	5.2.12	VSWR (RETURN LOSS)					
			2 <b>60.</b> 7-287. 7, 3 <b>56. 7</b> -3	883.7 MHz				
			DUAL S11: 7.5/ dB			12.0	d₿	<u> </u>
			DUAL S22: 7.5/ dB			10.5	dВ	<u> </u>
	4.8.2	5.2.14	LIMITED FUNCTIONAL			60		`
			CENTER FREQUENCY: -			<u> </u>	MHz	alal atak
			3 dB BANDWIDTH: -0.			_ ಲ್ಲ	MHz	<del>\</del>
			INSERTION LOSS: -0.	5/0.5 dB	١.	<u> </u>	d₿	二
	NONE	5.2.15	DATA SHEET SUMMARY			Ģ	(5)	
_	_		(PASS/FAIL)			<u> </u>	(D)	
	<b>}</b>	<del></del> -						

PHONON CORPORATION 7 HERMAN DRIVE SIMSBURY, CT 06070

CAGE: 6Y858 TEL: 203-651-0211

FAX: 203-651-8618

```
FILE=1AC8B03A. DAT 08:54:21 10-28-1997
 PN_198828_823 FINAL_FUNCTIONAL TEMP:C FLIGHT3 FUNCT3 /N DUAL_SXX
 18-23-1997 HP8753, SSCF, SSFF1X, SSREF
 FREDUENCY (MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
 REFERENCES: LOSS(DB) = 28.38314 PHASE(DEG) = -53898.78 DELAY(US) = 8 SLOPE(US/MHZ) = 8
 PHS ERRORS: LOSS(DB)= .167253 PHASE(DEG)= 1172,369
  .OT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV
 LOSS TO DB/DIV
 LOSS 1 DB/BIV
FREQ 10 MHZ/DIU
PEAK: LEVEL(DB) = 27.88254 FREQ(MHZ) = 289.3811 DELAY(US) =-.4195124 SIDELOBE(DB) =-43.51648
ENERGY: LEVEL (DB) = 28.52853 CENTER (NHZ) = 275.1333 WIDTH (NHZ) = 36.58653 SKEW (NHZ) = -.514683
L(DB)
         LO(MHZ)
                     HI (MHZ)
                               ETR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ)
                                                                                                   HIX (MHZ)
 -8.58
         289.39106
                     289.38106
                                 289, 39196
                                               8.00000
                                                         289.30106
                                                                        0.00000
                                                                                    9.99999
                                                                                              289.38106
                                                                                                           289.30106
 8.58
        259.39005
                     290.96868
                                 275.17532
                                              31.57856
                                                         275.33286
                                                                       31.78383
                                                                                  -12.91031
                                                                                              259.39005
                                                                                                           298, 96868
 1.00
        258,73251
                     291.36230
                                 275.84742
                                              32.62979
                                                         275.33554
                                                                       32.46771
                                                                                  -13.78188
                                                                                              258.73251
                                                                                                           291.36230
 2.00
        257.92686
                     291.92498
                                 274.92548
                                              33.99884
                                                         275.32108
                                                                       33.64267
                                                                                  -16.01550
                                                                                              257.92686
                                                                                                           291.92498
 3.00
         257.35327
                     292.31616
                                 274.83472
                                              34.96289
                                                         275.19768
                                                                       34.30381
                                                                                  -18.15461
                                                                                               257.35327
                                                                                                           292, 31616
 4.00
        256, 91467
                     292.63448
                                 274.77454
                                              35.71973
                                                         275. 19147
                                                                       34.63564
                                                                                  -19.85340
                                                                                              256.91467
                                                                                                           292.63448
 5.00
                                                                       34.76588
        256.55911
                     292, 98878
                                274.72992
                                              36.34158
                                                         275.12183
                                                                                  -20.75171
                                                                                              256.55911
                                                                                                           292.90070
                                                                       34.88889
 6.99
        256, 26899
                     293.12421
                                 274.69268
                                              36.86322
                                                         275.18079
                                                                                  -21.75987
                                                                                              256, 26899
                                                                                                           293, 12421
 18.00
        255.39572
                     293, 90140
                                 274.64856
                                              38.50568
                                                                       35.20095
                                                                                  -27.75864
                                                         275.13397
                                                                                              255, 39572
                                                                                                           293, 98148
 28.88
        253.87450
                                                                       35.29353
                                                                                  -37.24678
                     295.24823
                                 274.56137
                                              41.37373
                                                         275.13403
                                                                                              253, 87458
                                                                                                           295.24823
                                                                       35.38259
 30.00
        253. 03766
                     296.20098
                                 274.61926
                                              43.16324
                                                                                  -44, 42536
                                                         275.13367
                                                                                              253, 03766
                                                                                                           296, 20090
        251.89464
 48, 88
                     297.31668
                                 274.56867
                                              45.51204
                                                         275.13354
                                                                       35.38339
                                                                                  -46.36879
                                                                                              251.88464
                                                                                                           297.31668
BAND (NHZ)
           268.788 287.788
LMIN(DB)
                  -0.44
LWAX (DB)
                   0.24
LDEL (DB)
                   8.58
PMIN (DEG)
               -1998.03
PMRX (DEG)
               1997.38
PDEL (DEG)
               3995.41
```

File: 1AC8B83A.DAT Passband Symmetry = 0.4 dB

PHONON CORPORATION

```
<del>PH</del>ONON CURPURATION
 FILE=1CC8B03A.DAT 08:54:38 10-28-1997
 PN 100828_823 FINAL_FUNCTIONAL TEMP:C FLIGHTS_FUNCT3 /N DUAL_SXX
 10-23-1997 HP8753, SSCF, SSFFIX, SSREF
FREQUENCY (MHZ): CENTER= 370.2 WIDTH= 100 INCR. = .4 SYSTEM BANDWIDTH= 27
 REFERENCES: LOSS(DB) = 28.46887 PHRSE(DE6) = -61191.61 DELAY(US) = 0 SLOPE(US/NHZ) = 0
 RMS ERRORS: LOSS(DB)= .1524634 PHRSE(DE6)= 1129.057
  .OT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV
 LOSS TO DB/DIV
LOSS-1-DB/BIV --
      Myright
FREQ 10 MHZ/DIV
PEAK: LEVEL(DB) = 27.98187 FREQ(MHZ) = 384.2886 DELAY(US) =-.4062741 SIDELOBE(DB) =-42.89388
ENERGY: LEVEL(DB) = 28.58864 CENTER(MHZ) = 371.1011 WIDTH(MHZ) = 36.8871 SKEW(MHZ) = -.3520845
 L(DB)
          LO(MHZ)
                     HI (MHZ)
                               CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ)
                                                                                                 HIX (MHZ)
 -0.56
         384.20062
                     384, 20062
                                 384.20062
                                               0.00008
                                                         384.20062
                                                                       8.88888
                                                                                    8,00000
                                                                                              384.20062
                                                                                                          384.20062
  0.50
         354, 49826
                     387.02179
                                 370.76001
                                              32.52353
                                                         371.82386
                                                                       32.97110
                                                                                  -13.77400
                                                                                              354, 49826
                                                                                                          387. 62179
  1.00
         354.11926
                     387.48840
                                 370.80383
                                              33.36914
                                                         371.01730
                                                                       33.62538
                                                                                  -14.85364
                                                                                              354.11926
                                                                                                          387.48840
  2.80
         353,60828
                     388.09531
                                 370.85181
                                              34.48703
                                                                       34.19163
                                                                                 -16.07844
                                                         371.02109
                                                                                              353, 68828
                                                                                                          388.09531
  3.00
         353.18768
                     388.52826
                                 370.85797
                                              35.34858
                                                         371.02463
                                                                       34.65882
                                                                                 -17.49293
                                                                                              353.18768
                                                                                                          388.52826
                     388, 94584
                                              36.87339
                                                                      35.02833
  4.00
         352.87164
                                 370.90833
                                                         371.83836
                                                                                 -19.11136
                                                                                              352.87164
                                                                                                          388, 94584
  5.00
         352.58954
                     389, 28635
                                 370.93793
                                              36,69681
                                                         371.04205
                                                                       35.30993
                                                                                 -20.98541
                                                                                              352.58954
                                                                                                          389.28635
                                                                      35. 42587
                                                                                 -22.07453
  6.00
         352, 34213
                     389.57361
                                 370.95789
                                              37.23148
                                                         371.18214
                                                                                             352.34213
                                                                                                          389.57361
                                                         371.89824
                                                                      35.70012
                                                                                 -27.19496
 10.00
         351.68675
                     390.39968
                                 371.00317
                                              38.79285
                                                                                             351.68675
                                                                                                          390.39968
         358.34558
                                                                      35, 88545
 20.00
                     391.79144
                                              41.44586
                                                         371.10001
                                                                                 -36.84013
                                                                                              350.34558
                                 371.96851
                                                                                                          391.79144
 38.80
         349.38263
                     392.78772
                                 371.08517
                                              43, 40509
                                                         371.10107
                                                                       35.81643
                                                                                 -46.78313
                                                                                              349.38263
                                                                                                          392.78772
         348.80222
 48.88
                     393.32141
                                 371.06183
                                              44.51920
                                                         371.10114
                                                                      35.81673
                                                                                 -47.82705
                                                                                             348.88222
                                                                                                         393.32141
BAND (MHZ)
            356.700
                     383.700
LMIN(DB)
                  -0.36
LMAX (DB)
                   8.27
LDEL (DB)
                   8.63
               -1938, 46
PHIN(DEG)
PMAX (DEG)
                1919.84
PDEL (DEG)
                3850.30
```

File: 1CC8B83A.DAT

Passband Symmetry = 0.3 dB

### ELECTRICAL TEST DATA SHEFT

			LECTRICAL TEST DATA SHEET			
_	AEROJET PA	ART: 133	31576-1 PHONON PART: 100823		33	
	<b>TESTED BY</b>	• - ઝાર	TITLE: Test DATE: 13	:/>∀-⊃ T∏	YE: - 7 - 7 - 7 - 7	
١.	TEST: FINE	AL FUNCT	TIONAL		· · · · · · · · · · · · · · · · · · ·	
	EQUIPMENT			CAL DUE: 12	2/10/97	
		HP 34		CAL DUE:7		
			DERTHE LEIGHNOOTE	_ ONE DOE:	, , , , , ,	
	PARAGR	apu	REQUIREMENT TITLE	DATA		P/F
	REQ.	Q/ATP	REGULTERY TILE	חוחע		F/1
			OPERATING TEMPERATURE	14.9	r	р
	7 2 1 7	5 2 7	CENTER FREQUENCY &	17.3	_ `	<u></u>
		J. E. J	CENTER FREQUENCY STABILITY			
	3.2.1.4			274 20	P MIL.	_
			LO: 273.335/275.065 MHz	<u>274.38</u>		<u>р</u>
		1	HI: 369.335/371.065 MHz	<u>370.23</u>	MHZ	<u> </u>
	3.2.1.5		3 dB BANDWIDTH:			_
			LD: 34/36 MHz	34.89		p p
			HI: 34/36 MHz	<u>35.29</u>	1 MHz	<u> </u>
	3.2.1.6		PASSBAND SYMMETRY			
			LO: /0.5 dB	0.3_	dB	P P
			HI: /0.5 dB	0.2	dB	<u> P</u>
	3.2.1.7	5.2.6	FASSBAND RIPPLE			
			260.7-287.7 MHz: /1.0 dB	0.5	dB	<u>p</u>
			356.7-383.7 MHz: /1.0 dB	0.5	dB	P
	3.2.1.8	5.2.7	INSERTION LOSS		<del>_</del>	
			LO: 27.8/30.2 dB	28.5	dB	<u>p</u>
			HI: 27.8/30.2 dB	28.4		P
	3.2.1.9		INSERTION LOSS VARIATION			<del></del>
	0.2		LO: -0.4/0.4 dB	0.0	dB	D
			HI: -0.4/0.4 dB	0.0		P
	7 2 1 10		AMPLITUDE BALANCE		ub	<u>-</u>
	3. 2. 1. 10	J. L. J	LO, HI: /0.5 dB	0.1	dВ	<u>p</u>
	7 2 1 11	5 2 10	OUT-OF-BAND REJECTION		05	
	J. C. 1. 11	J. L. 10		EVK (QB)	WIDTH(MHz)	
				45. 2	0.000	
			<del>-</del>	4J. E	er. erere	
			DUAL: 225.000-249.935,			
			298. 465-345. 935,			
				42.4	0.000	_
			<del>-</del>	<u>42.4</u> dB		<u>P</u>
			WIDTH: /7.2 MHz		0.000 MHz	p
	3.2.1.12		SHAPE FACTOR			_
			LO: /1.30 Unitless	1.30		P P
			HI: /1.30 Unitless	1.26	Unitless	<u> </u>
	3.2.1.14		VSWR (RETURN LOSS)			
			260.7-287.7,356.7-383.7 MHz			
			DUAL S11: 7.5/ dB	12.7	dB	<u>P</u>
			DUAL S22: 7.5/ dB	10.4	d₿	P
	4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS	· · · · · · · · · · · · · · · · · · ·	<del></del>	_
			CENTER FREQUENCY: -0.2/0.2 MH	12 0.014	⊘ MHz	P
			3 dB BANDWIDTH: -0.72/0.72 MF		_	P
			INSERTION LOSS: -0.5/0.5 dB	12 D. O.C.	dB	<u> </u>
	NONE	5, 2, 15	DATA SHEET SUMMARY			—
		2. 2. 10	(PASS/FAIL)	Ð	DP	
				<del></del>		
	HONON COR	יו דםקחק:	IN.		CAGE: 6Y858	
$\sim$	7 HERMAN I		41		TEL: 203-651-	<b>R</b> 211
	SIMSBURY,		'A		FAX: 203-651-	
	orriodoni,	L1 000/	ย		1 UV: E40_001_	0010

```
FILE=1ARBBC3A.DAT @3:14:47 10-28-1937
 PN 100828_823 FINAL_FUNCTIONAL TEMP:R FLIGHT3_FUNCT3 /N DUAL_SXX
 10-23-1997 HP8753, SSCF, SSFFIX, SSREF
 FREQUENCY (MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
 REFERENCES: LOSS(DB) = 28.52073 PHASE(DEG) = -55530.74 DELAY(US) = 0 SLOPE(US/MHZ) = 0
  MS ERRORS: LOSS(DB)= .1623913 PHASE(DEG)= 1174,236
 LOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED 10 MHZ/DIV
 LOSS TO FB/DIV
 LOSS 4 DB/BIU --
                                    ∿∕∖⊬∖⊬∖
FREQ 10 MHZ/DIV
PEAK: LEVEL (DB) = 27.99685 FRED (MHZ) = 288.8315 DELGY (US) =-.4191471 SIDELOBE (DB) =-43.39276
L(DB)
         LO(MHZ)
                   HI (MHZ) CTR (MHZ) WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                      HIX (MHZ)
 -0.52
        288.83145
                   288. 83145 288. 83145
                                          0.00000 288,83145
                                                                8, 80888
                                                                           0.00330
                                                                                    288, 83145 288, 83145
  0.50
        258, 97787
                   290.46780
                                                                         -12.98503
                             274.72284
                                          31.48993
                                                  274.89838
                                                               31.63238
                                                                                    258.97787
                                                                                                290, 46780
        258, 32176
  1.03
                   290.87149 274.58561
                                          32.56973
                                                  274.88800
                                                               32.36905
                                                                         -13.85985
                                                                                    258, 30176
                                                                                                290, 87149
  2.00
        257, 58403
                  291.44968 274.47687
                                         33, 94559 274, 86368
                                                               33.52849
                                                                         -15, 10470
                                                                                    257, 58489
                                                                                               231,44968
        256, 93671
  3.00
                  291.83533
                            274.38602
                                        34.89862 274.73370
                                                               34.18233
                                                                         -18.26951
                                                                                    256, 93671
                                                                                                291, 83533
  4.00
        256.49368 292.15924
                                                               34.35263
                             274.32648
                                        35.66556
                                                  274.64380
                                                                         -19.05144
                                                                                    256, 49368
                                                                                               292, 15924
 5. 88
        256.13690 292.41360
                             274,27527
                                         36.27670 274.65146
                                                               34. £3902 -20. 91871
                                                                                    256, 13690
                                                                                               292,41360
 6.00
        255.84021
                  292.65176
                            274.24597
                                         36.81155 274.70645 34.74549 -21.87951
                                                                                    255, 84021
                                                                                               292, 65176
 10.00
        254.97766 293.42582 274.20135
                                         38.44736 274.65228 35.05886 -27.95840
                                                                                    254.97766
                                                                                               293, 42502
 20.00
        253.45700 294.77661
                             274.11682
                                         41.31961 274.64886
                                                               35.14732 -37.43073
                                                                                    253, 45700
                                                                                               234.77661
                                                               35.15554 -43.69241
 38.00
        252,61900 295,74387
                              274.18143
                                         43.12486 274.64780
                                                                                    252,61900
                                                                                               295, 74387
        251.35533 296.87003
 40.00
                                        45.51469 274.64783
                                                               35.15673 -46.40009 251.35533
                             274.11267
                                                                                               296.87003
BAND (MHZ) 260.700 287.700
LMIN(DB)
                -0.39
LMAX (DB)
                 0.25
LDEL (DB)
                 0. £4
PMIN (DEG)
             -1999.03
PMAX (DEG)
              2002.51
DEL (DEG)
              4001.54
```

le: 1ARBB83A.DAT Passband Symmetry = 8.3 dB

```
FILE=1CR8B03A.DAT 89:16:01 10-28-1997
 PN 100828_823 FINAL_FUNCTIONAL TEMP:R FLIGHT3 FUNCT3 /N DUAL SXX
 10-23-1997 HP8753, SSCF, SSFFIX, SSREF
 FREQUENCY (MHZ): CENTER= 370.2 WIDTH= 100 INCR. = .4 SYSTEM BANDWIDTH= 27
 REFERENCES: LOSS(DB) = 28.40574 PMRSE(DEG) = -62641.14 DELAY(US) = 0 SLOPE(US/MHZ) = 0
MS ERRORS: LOSS(DE)= .1447831 PHASE(DE6)= 1131.83
 ALOT SCALES: LOSS 10 DE/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV
 LOSS TO DE/DIV
 LOSS-1-PB/PIV-
 FREG 10 KHZ/DIV
PEAK: LEVEL(DB) = 27.94081 FREQ(MHZ) = 383.5507 DELAY(US) =-.4077598 SIDELOBE(DB) =-42.64866
ENERGY: LEVEL(DB)= 28.54845 CENTER(MHZ)= 370.4323 WIDTH(MHZ)= 36.86098 SKEW(MHZ)=-.2677197
 L(DB)
        LO(MHZ)
                    HI (MHZ) CTR (MHZ) WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                           HIX (MHZ)
         383.55866
 -0.46
                    383, 55066
                                383.55066
                                             0.00000 383,55066
                                                                    0.00000
                                                                               8,00200
                                                                                         383, 55066 383, 55066
  8.50
         353.87311
                    386.33102
                               370.10205
                                            32, 45732
                                                                   32.51811
                                                                             -13. 33641
                                                      370, 35908
                                                                                         353.87311
                                                                                                    386. 33102
  1.30
         353.53833
                    386, 81836
                               378, 17435
                                            33.27203
                                                      370.35669
                                                                   33.20163
                                                                             -14.34587
                                                                                         353.53833
                                                                                                    386, 81836
  2.00
         353.01898
                    387.45499
                               370.23700
                                            34.43600
                                                      370.48462
                                                                   34.06599
                                                                             -15.14244
                                                                                         353.01898
                                                                                                    387, 45499
  3.00
       352.59198
                    387.88345
                                                                             -18.39550
                               370.23773
                                            35, 29147
                                                      370.35931
                                                                   34.72739
                                                                                         352.59198
                                                                                                    387.88345
  4.00
       352,28180 389,30161
                               370.29169
                                            36. 01981 370. 44568
                                                                   34.89637
                                                                             -19.20515
                                                                                         352, 28180
                                                                                                    388, 30151
       352.00000 388.65530
  5.00
                               370.32764
                                            36, 65530 370, 43588
                                                                             -21.12831
                                                                                                    388,65530
                                                                   35.17787
                                                                                         352, 88888
  6.00 351.75717 388.94501
                               370.35107
                                            37.18784 370.38049
                                                                  35.28275
                                                                             -22.13485
                                                                                         351.75717
                                                                                                    388,94501
       351.01746 389.78760 370.40253
 10.00
                                                                             -25.89313
                                            38.77014 370.42920
                                                                  35.51081
                                                                                         351.01746
                                                                                                    389.78768
 20.00
        349.76459 391.17426 370.46942
                                            41.40967
                                                                  35.66169
                                                                             -38.79528
                                                      370.43143
                                                                                         349.76459
                                                                                                    391, 17425
 30.00
                                            43.37015 370.43216
        348.80648
                    392.17654
                               370.49146
                                                                             -45, 63982
                                                                   35.66792
                                                                                         348.80540
                                                                                                    392, 17654
 40.00
       348.19073
                                         44.53476 370.43228
                    392,72549 370,45813
                                                                  35.66861 -48.10805
                                                                                         348.19873
                                                                                                    392,72549
BAND (MHZ) 356.700 383.700
LKIN(DB)
                 -0.45
LXAX (DB)
                  0.28
LDEL (DB)
                  0.73
PMIN (DEG)
              -1932.73
PMAX (DEG)
               1925, 15
PDEL (DEG)
               3857, 88
```

ile: 1CR8B03A.DAT Passband Symmetry = 0.2 dB

```
FILE=1ER8203A. DAT 09:17:10 10-28-1997
 PN 100828_823 FINAL_FUNCTIONAL TEMP:R FLIGHT3_FUNCT3 /N WIDE_S21
 10-23-1997 HP8753, SSREF, SSREF
 FREQUENCY (MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .208125 SYSTEM BANDWIDTH= 999
 REFERENCES: LOSS(DB) = 28.46323 PHASE(DEG) = 18137.98 DELAY(US) = .0511545 SLOPE(US/MHZ) = 0
 MS ERRORS: LOSS(DB) = 16.34892 PHASE(DEG) = 4165.185
 LOT SCALES: LOSS 10 DB/DIV VS. FRED 99.9 MHZ/DIV
 LOSS TO DB/DIV
      9.9 MHZ/DIV
FEAK: LEVEL(DB) = 27.9882 FRED(MHZ) = 288.8195 DELAY(US) =-.3216876 SIDELOBE(DB) =-42.76309
ENERGY: LEVEL (DB) = 28.71495 CENTER (MHZ) = 322.4307 WIDTH (MHZ) = 73.32967 SKEW (MHZ) = 3.453759
                    HI (MHZ) CTR (MHZ) WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DE) LOX (MHZ) HIX (MHZ)
 L(DB)
         LO(MHZ)
 -0.48 288.81955 288.81955 268.81955 0.00000 289.81955 0.50 259.11450 290.42316 274.76883 31.30855 275.05991 1.00 258.39307 290.81100 274.60205 32.41794 274.87054 2.00 257.52838 291.42102 274.47470 33.89264 274.78470 3.00 256.95645 291.80908 274.38275 34.85263 274.71964
 -0.48
                                                                          0. 99993
                                                                                      0.00000 288.61955 288.81955
                                                                          38.92927
                                                                                      -14.02361
                                                                                                  259.11450 386.18835
                                                                          31. 98620 -14. 14625 258. 39307 386. 64908
                                                                          33. 03291 -14. 26353 257. 52838 387. 38171
                                                                          33.61094 -14.32917 256.95645
  4.00 256.50568 292.13727 274.32196 35.63058 274.67014
5.00 256.15414 292.40701 274.28058 36.25287 274.67014
                                                                          33, 88848 -14, 35967 256, 50658 388, 24298
                                                                          34.17970 -14.39283 256.15414
                                                                                                               388, 60187
  E. 00 255, 85474 292, 63733 274, 24603 36, 78259 274, 66818
                                                                          34.29170 -14.40435 255.85474
                                                                                                               388, 98292
 10.00 254.98589 293.41281 274.19934 38.42693 274.64529 34.54037 -14.42797 254.98589
                                                                                                              389.76309
 20.00 253.46227 294.77307 274.11768 41.31081 274.64481
                                                                          34.67558 -14.43189 253.46227
                                                                                                                391.15274
 30.00 252.61890 295.72415 274.17151
                                               43.10526 274.64413 34.68423 -14.42484 252.61890
                                                                                                                392.16281
 40.00 251.36394 295.83344 274.09869 45.4
PAND(MPHZ) 1.000 225.000 420.000 1003.000
                                               45.46950 274.64420 34.68489 -14.41417 251.36394 392.71570
BAND (MHZ)
LMIN(DP)
                45.15
                          -0.48 47.10
LMAX (DB)
                             57.98
                  95. QE
                                        €1.58
LDEL (DB)
                 49.91
                            58. 4E
                                      14, 47
PMIN(DEG)
                3434.19 -3783.19 -3312.89
PMAX (DEB)
                7098.78 7528.90 7315.59
```

PDEL (DEG)

3664.59 11312.09 10628.48

ILE: 1ER8B03A.DAT Out-of-band Rejection: PEAK= 45.2 dB WIDTH= 0.000 MHz

```
PN 100828 823 FINAL FUNCTIONAL TEMP:R FLIGHT3 FUNCT3 /N DUAL SXX
  10-23-1997 HP8753, SSREF, SSREF
  FREQUENCY (NHZ): CENTER= 322.2 WIDTH= 200 INCR. = .4 SYSTEM BANDWIDTH= 200
  REFERENCES: LOSS(DP)= 28.46323 PHASE(DEG)=-59374,18 DELAY(US)= .2186431 SLOPE(US/NHZ)= 0
\ 15 ERRORS: LOSS(DB)= 22.57773 PHASE(DEG)= 940.4073
  LOT SCALES: LOSS 10 DB/DIV VS. FREQ 20 MHZ/DIV
  LOSS TO DB/DTV/
                                                                        white which the
  FREQ 20 HHZ/DIV
  PEAK: LEVEL (DB) = 27.94081 FREQ (MHZ) = 383.5507 DELAY (US) = 2.952753E-02 SIDEL DBE (DB) =-42.84866
  ENERGY: LEVEL (DB) = 28.61226 CENTER (MHZ) = 323.5196 WIDTH (MHZ) = 73.31353 SKEW (MHZ) =-1.816307
                 LD(MHZ) HI(MHZ) CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ)
   L(DB)
                                                                                 0. 00000 383. 55069 0. 00000 0. 00000 383. 55069
    -0.52 383.55069 383.55069 383.55069
                 353, 81171 396, 38266
                                                            370.09717
                                                                                   32.57095 370.35908
                                                                                                                              32, 95141 -6, 46354 259, 34509
                                                                                                                                                                                            385.38266

      0.50
      353,81171
      396,38266
      370,09717
      32,57095
      370,35908
      32,95141
      -6,45354
      259,34509
      386,38266

      1,00
      353,50333
      386,86954
      370,18643
      33,36621
      370,35659
      33,64404
      -6,52304
      258,37491
      386,86954

      2,00
      352,99127
      387,47955
      370,23541
      34,48828
      370,35715
      34,77341
      -6,62767
      257,53857
      387,47955

      3,00
      352,57413
      387,98866
      370,24139
      35,33453
      370,35928
      35,19012
      -6,65767
      256,96661
      387,98866

      4,00
      352,26395
      388,32397
      370,29395
      36,9603
      370,44568
      35,36135
      -6,65771
      256,51465
      388,32397

      5,00
      351,98511
      389,67331
      370,35220
      37,21619
      370,43598
      35,54660
      -6,67614
      256,15540
      388,67331

      6,00
      351,74411
      389,96030
      370,35220
      37,21619
      370,42920
      35,75288
      -6,67524
      255,85590
      388,96030

      10,00
      351,00791
      389,79828
      370,40305
      39,79047
      370,42920
      35,98398
      -6,66184

     0.58
  40.00 348.18851 392.72806 370.45828 44.5
PAND(MHZ) 260.700 287.700 356.700 383.700
                                                                                44.53955 370.43228 36.14389 -6.52450 251.36688 392.72806
  LMIN(DB)
                                 -0.33
                                               -0.44
                                                                -0.50
                                                                   0.22
  LMAX (DB)
                                    0.31
                                                   £2,22
  LDEL (DB)
                                                 60.6E
                                                                    0.73
                                   0. E4
  PMIN(DEG)
                            -1254.75 -1962.21 -582.54
  PMAX (DE6)
                               668.80 1885.44 1197.36
  PDEL (DEG)
                              1923.56 3848.64 1779.89
    "LE: 1FR8B03A.DAT Out-of-band Rejection: PEAK= 42.4 dB WIDTH= 0.000 MHz
```

PHONON CORPORATION FILE=1FR8383A.DAT 09:17:49 10-28-1997

FILE: 1FR8B03A.DAT (+SSCF)

PN\_100828\_823 FINAL\_FUNCTIONAL\_TEMP:R FLIGHT3\_FUNCT3 /N DUAL\_SXX 10-23-1997 HP8753, SSREF, SSREF, SSCF
REFERENCES: LCSS(DB)= 28.46323 PHASE(DEB)= -59374.18
DELAY(US)= .2186431 SLOPE(US/MHZ)= 0

JANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY (MHZ)	LOSS (DB)	PHASE (DEE)
240.600	45.97	569.06
248.760	4£.7€	1200.42
256.920	3.09	<b>958.</b> 52
265. 080	0. 0E	372.80
273.240	<b>0.</b> 15	-224.78
281 <b>. 400</b>	<b>8.</b> 16	-821.71
289. 568	<b>-0.</b> 15	-1409.45
297.720	49.70	-1818.87
385.880	46.13	-1231.96
314.040	48.18	-€12.7E
322.200	47.60	8.99
33 <b>0. 360</b>	47.82	627.53
338. 52 <b>0</b>	49. 47	1262.54
345.£80	47.63	1882.46
<b>354.840</b>	-0.12	1339.07
363.000	<b>0.</b> 22	7 <b>95.</b> 17
371.160	-0.11	244.19
379.320	-0.22	-385.57
387 <b>. 480</b>	1.98	-846 <b>. C</b> 7
395.640	47.32	-1159.38
403.800	47.33	-553.29

ELECTRICAL TEST DATA SHEET

			LECTRICAL TEST DATA SHEET					
			31576-1 PHONON PART: 1008					
	TESTED BY		TITLE: Text DATE:	111 <u>45/20/55</u>	ME: <u> </u>	<u></u>		
	TEST: FINA	AL FUNCT	TIONAL	<i>:</i>				
	EQUIPMENT:	HP 875	53D SERIAL:3410A07982	CAL DUE: 1	2/10/97			
			78A SERIAL:2136A03127	CAL DUE:7				
	PARAGRA	APH	REQUIREMENT TITLE	DATA		P/F		
		Q/ATP						
			OPERATING TEMPERATURE	_35, 3_	С	p		
			CENTER FREQUENCY &					
	3.2.1.4		CENTER FREQUENCY STABILITY					
	O. L		LO: 273.335/275.065 MHz	273.96	2 MH-7	p		
			HI: 369.335/371.065 MHz	369.65		<u>p</u>		
	70 • 5		3 dB BANDWIDTH:	353.63	rinz	<u>-</u> -		
	3.2.1.3			74.04	9 MUL	n		
			LD: 34/36 MHz	<u>34.84</u>	_	P P		
	2046		HI: 34/36 MHz	<u>35.22</u>	<u>b</u> mmz	<u> </u>		
	3.2.1.6		PASSBAND SYMMETRY	0 /	שר	n		
			LO: /0.5 dB		— dB	<u>P</u>		
			HI: /0.5 dB	_0.2	dB	<u> </u>		
	3.2.1.7	5.2.6	PASSBAND RIPPLE			_		
			260.7-287.7 MHz: /1.0 dB	_ 0. 5		<u>p</u>		
			356.7-383.7 MHz: /1.0 dB	0.4	dB	<u> </u>		
	3.2.1.8		INSERTION LOSS			_		
			LO: 27.8/30.2 dB	28.7		<u>p</u>		
			HI: 27.8/30.2 dB	28.4	dB	<u>_p</u> _		
	3.2.1.9		INSERTION LOSS VARIATION					
			LO: -0.4/0.4 dB	0.1	dB	<u> p</u>		
_			HI: -0.4/0.4 dB	-0.0	dB	<u> P</u>		
	3.2.1.10	5.2.9	AMPLITUDE BALANCE					
			LO, HI: /0.5 dB	0.3	dB	<u> </u>		
	3.2.1.11	5.2.10	OUT-OF-BAND REJECTION	-				
			BAND	PEAK (dB)	WIDTH (MHz)			
			WIDE: 1-225,420-1000 MHz:	44.7	0.000			
			DUAL: 225.000-249.935,					
			298. 465-345. 935,					
			394.465-420.00 MHz:	43.1	0.000_			
			PEAK: 35.0/ dB	43.1 dB		P		_
			WIDTH: /7.2 MHz		0.000 M	Hz P	Accept	the re
	3 2 1 12	5 2 11	SHAPE FACTOR				/ 1120411	
	0	J. L. 11	LO: /1.30 Unitless	1.31	Unitless	F 🔏	SDAR	John Per - 97-222
			HI: /1.30 Unitless	1.26	_			• •
	3 2 1 14	5 2 12	VSWR (RETURN LOSS)					(2.5)
	3. 6. 1. 17	J. E. IE	260.7-287.7,356.7-383.7 MH	7				
			DUAL S11: 7.5/ dB	12.9	dВ	P		1-14-98
			DUAL S22: 7.5/ dB	10.0	dB	<u>p</u>		,
	4.8.2	5 2 14	LIMITED FUNCTIONAL TESTS	10.0	00	<del></del>		
	4.0.2	J. C. 14	CENTER FREQUENCY: -0.2/0.2	MU-	MHz	0		
					MHz	<del>'</del> 0		
			3 dB BANDWIDTH: -0.72/0.72		— dB	7		
	AIGAIC	E 2 4E	INSERTION LOSS: -0.5/0.5 di	·	— <b>"</b>	、大	_	<b>05</b> :
	NONE	J. C. 15	DATA SHEET SUMMARY	IJ	(D)	Dan	Per SDAR	47-222
			(PRSS/FAIL)		<u>-U</u>	יען י	181	•,
	MUDALON CO.	0000077			CAGE: EY85	:a	( 9.5 ( 9.5	)1-14-93
_	HONON COL		NA NA	•	TEL: 203-6		( )	11-14-93
	7 HERMAN I		70					•
	SIMSBURY,	CI MEM.	/ <b>U</b>		FAX: 203-6	M1_0010		

#### PHONON CORPORATION E=1A48903A.DAT 03:37:01 10-28-1997 100828\_823 FINAL\_FUNCTIONAL TEMP:H FLIGHT3\_FUNCT3 /N DUPL\_SXX 18-23-1997 HP8753, SSCF, SSFF1X, SSREF FREQUENCY (MHZ): CENTER= 274.2 WIDTH= 100 INCR. = .4 SYSTEM BANDWIDTH= 27 REFERENCES: LOSS(DB) = 28.66347 PHASE (DEG) =-54415.22 DELAY (US) = 0 SLOPE (US/MHZ) = 0 RMS ERRORS: LOSS(DB)= .160555E PHASE(DEG)= 1175.957 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV LOSS TO DE/DIV LOSS-1-DB/PHV للمنابخ رويدور FREQ 18 MMZ/DIV PEAK: LEVEL(DB)= 28.1961 FREQ(MHZ)= 268.3701 DELAY(US)=-.419409 SIDELOBE(DB)=-43.41243 ENERGY: LEVEL (DB) = 28.83453 CENTER (MHZ) = 274.1954 WIDTH (MHZ) = 36.43219 SKEW (MHZ) =-.4063132 L(DB) LD(MHZ) HI (MHZ) CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ) HIX (MHZ) -0.47288, 37006 288, 37005 288.37006 9, 20039 288, 37086 0.00000 8.00000 288, 37005 288.37006 0.50 290.01035 258, 59406 274.38219 31.41529 274, 45514 31.60976 -13.05315 258, 59406 290.01035 1.00 257.90838 32,50293 274, 45081 290, 41101 274.15955 32, 28034 -12.93349 257,90808 290, 41101 2.00 257, 10935 291.883391 274. 25695 33, 89395 274.42245 33.42522 -16.19049 257, 10995 291.00391 3. 38 256.54193 -17.55515 291.38193 34.83994 274.18973 33.87395 273.96198 256.54199 291, 38193 4.60 256.09796 291, 70341 35, 51145 274.20013 273.90359 34.24214 -19.17768 256. 23796 291, 70941 255.74228 5.00 274.20535 291,95640 273, 85434 36, 22412 34,52197 -21, 05706 255.74228 291.96540 6.00 255, 44510 292, 20834 273.82672 36,76324 274.25886 34.62340 -21.99823 255, 44510 292, 20834 10.00 254, 58388 232, 39804 273, 78192 38, 39624 274.18060 34.89066 -26, 63951 254.58380 292, 98894 20.00 253,86262 274, 19551 294, 33499 273, 69879 41.27237 35.01477 -37.58452 253, 05262 294, 33499 30.00 252,22723 295, 31247 43.08524 274.19559 273.76984 35.02262 -43, 67920 252,22723 295.31247 43.00 250, 93283 45,54895 -46.22178 235.48178 273.70731 274.19559 35.02377 250, 93283 296, 48178 BAND (MHZ) 260.700 287.700 LMIN(DB) -0.43\*9X (DE) 8.25 .EL (DE) 83.9 PMIN (DEG) **-2002. 8**3 PMAX (DEG) 2006, 24 PDEL (DEG) 4008.26

File: 1AHBB03A.DAT

Passtand Symmetry = 0.4 dB

```
PHONON CORPORATION
  'E=1CH8B03A.DAT 09:38:15 10-28-1997
   100828 823 FINAL FUNCTIONAL TEMP:H FLIGHT3 FUNCT3 /N DUAL SXX
10-23-1997 HPS753, SSCF, SSFFIX, SSREF
FREQUENCY(MHZ): CENTER= 370.2 WIDTH= 100 INCR.= ,4 SYSTEM BANDWIDTH= 27
REFERENCES: LOSS(DB)= 28.36187
                                 PHASE (DEG) =-61743.8 DELAY (US) = 0 SLOPE (US/MHZ) = 0
RMS ERRORS: LOSS(DB)= .1309599
                                PHASE (DEG) = 1132.885
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREG 10 MHZ/DIV
LOSS TO DEZDIV
HOSS-1-DB/DHV
   FREQ 10 MHZ/DIV
PEAK: LEVEL(DB) = 27.97114 FRED(MHZ) = 382.9987 DELAY(US) = -. 4059882 SIDELDBE(DB) = -42.13871
ENERGY: LEVEL (DB) = 28.51924 CENTER (MHZ) = 369.7909 WIDTH (MHZ) = 36.83355 SKEW (MHZ) = -.1801905
                                           WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
 L(DB)
          LO(MHZ)
                     HI (MHZ)
                                CTR (MHZ)
                                                                                                   HIX(MHZ)
 -8.39
         382, 93866
                     382, 99866
                                  382,99866
                                                           382, 99866
                                                                         0.00000
                                                                                     0.03030
                                                                                                382,99866
                                                8.00000
                                                                                                            382, 99865
                                                                                   -13.41817
  0.50
         353.33405
                     385, 53470
                                  369, 48438
                                                32, 30066
                                                           369, 53207
                                                                        32.41645
                                                                                                353.33405
                                                                                                            385. 63470
         352, 96243
                     385, 14270
                                  369, 55255
                                                32.18027
                                                           359, 53995
                                                                        33,08407
                                                                                   -14.41511
                                                                                                352, 98243
  1.00
                                                                                                            386, 14270
                     386, 82294
                                                                        33.94769
                                                                                   -16.24256
                                                                                                352.45337
  2.00
         352, 45337
                                  369, 63815
                                                34.36957
                                                           369.70004
                                                                                                            385.82294
  3.00
         352, 04453
                     387, 27817
                                  369, 65735
                                                35, 22565
                                                           369, 70355
                                                                        34,40205
                                                                                   -17.67136
                                                                                                352.04453
                                                                                                            387, 27017
                     387.59473
                                                35.98198
                                                                        34.75925
  4.00
         351,71277
                                  369.70374
                                                           369.71100
                                                                                   -19.29943
                                                                                                351.71277
                                                                                                            387.69473
                                                           369.78848
                                                                        34,92878
                                                                                   -20, 21269
                                                                                                            388. 85829
  5.08
         351.44037
                     388.05029
                                  369.74533
                                                35,60992
                                                                                                351.44037
                                                           369.78394
                                                                                   -22, 30031
         351.19778
                     388, 34546
                                                37.14767
                                                                        35. 14376
                                                                                                351.19778
  5.00
                                  369.77161
                                                                                                            388.34546
                                                                        35.40566
                                                                                   -27.46840
                                                           369, 78458
 10.00
         358.46744
                     389.19655
                                  369,82700
                                                38.71912
                                                                                                350.46744
                                                                                                            389, 18655
                                                                        35.58475
                                                           369.78922
                                                                                   -37.12363
 20.00
         349.21472
                     398.58643
                                  369.90057
                                                41.37170
                                                                                                349.21472
                                                                                                            390.58643
 33.00
         348, 25946
                     391.59598
                                  369.92773
                                                43.33652
                                                           369,73092
                                                                        35, 51470
                                                                                   -45.80727
                                                                                                349, 25946
                                                                                                            391.59598
                                                          369,79080
                                                                        35.51531
                                                                                   -48. 88555
                                                                                                347.65298
 40.00
         347, 65298
                     392.13977
                                  369.89535
                                                44, 48679
                                                                                                            392, 13977
PAND (MHZ)
            355.700
                     383.702
LMIN(DB)
                  -0.39
~~4X (DB)
                   0.26
 (면)표
                   0.65
PMIN(DEG)
               -1935.29
PMAX (DEG)
                1928, 58
PDEL (DEE)
                3353, 87
File: 1CH8B03A.DAT
                       Passband Symmetry = 0.2 dB
```

# **Channel 12 Bandpass Filter**

SAW Filter (S/N: 1331576-2, S/N: B03)

			_
1			

# ELECTRICAL TEST DATA SHEET

AEROJET I	PART: 13		TRICAL TEST DATA: 1008 PHONON PART:		ERIAL:B	<b>8</b> 3	
			E: Timb DATE				
TEST: FI	NAL FUNC	TIONAL		<del></del>			
EQUIPMEN			ERIAL:3410A07982	CAL	DUE:1	2/10/97	
			SERIAL:2136A03127		_ DUE: 7		
					_		
PARAG	raph	REQUI	REMENT TITLE		DATA		P/F
REQ.	Q/ATP						
3.2.1.1	5.2.1	OPERATIN	IG TEMPERATURE		-4.7	C	_ <b>P</b> _
			REQUENCY &			_	_
3.2.1.4		CENTER F	REQUENCY STABILITY	1			
			335/301.065 MHz		300.38	3 MHz	Р
		HI: 343.	335/345, 965 MHz		344.15		P P
3.2.1.5	5.2.4	3 dB BAN	IDWIDTH:				
		LO: 15/1			15.44		<u>р</u>
3045		HI: 15/1			15.46	B MHz	<u>p</u>
3.2.1.6	5.2.5		SYMMETRY				
		LD: /0.5			0.2		P P
		HI: /0.5			0.3	dB	Þ
3.2.1.7	5.2.6	PASSBAND					
		294.2-30	6.2 MHz: /1.0 dB		0.5	dB	p
			0.2 MHz: /1.0 dB		0.7	dB	p
3.2.1.8	5.2.7	INSERTIO	IN LOSS				
		LO: 27.8	/30.2 dB		28.5	_ dB	p
		HI: 27.8	/30.2 dB		29.0	dB	<u>р</u>
3.2.1.9	5.2.8	INSERTIO	N LOSS VARIATION				
		LD: -0.4	/0.4 dB		-0.2	dB	<u>p</u>
		HI: -0.4	/0.4 dB		0.1	dB	p
3.2.1.10	5.2.9	AMPLITUD	E BALANCE				
			0.5 dB		0.5	_ dB	<u>p</u>
3.2.1.11	5.2.10	OUT-OF-B	AND REJECTION				
			BAND	PEAK (d	(B)	WIDTH(MHz)	
		WIDE: 1-	286,359-1000 MHz:	43.4		0.000	
		<b>DUAL: 28</b>	£. 000-288. 935,				
		31:	1.465-332.935,				
		35	5.465-359.00 MHz:	46.3		0.000	
		PEAK: 35	.0/ dB	43.4	dB		<u>P</u>
		WIDTH:	/3.2 MHz			0.000 MHz	p
3.2.1.12	5.2.11	SHAPE FA	CTOR				
		LO: /:	1.30 Unitless		1.27	Unitless	P
			1.30 Unitless		1.30	Unitless	<u>P</u>
3.2.1.14	5.2.12	VSWR (RE	TURN LOSS)				
		294.2-306	6.2,338.2- <b>350.</b> 2 MH	Z			
		DUAL S11	: 7.5/ dB		18.4	dB	of path
		DUAL S22	: 7.5/ dB		9.1	_ dB	<u>p</u>
4.8.2	5.2.14	LIMITED I	FUNCTIONAL TESTS		<i>a</i>		0
		CENTER FI	REQUENCY: -0.2/0.2	MHz	<u> </u>	_ MHz	1
		3 dB BAN	DWIDTH: -0.32/0.32	MHz	<u> </u>	MHz	上
		INSERTION	N LOSS: -0.5/0.5 d	В	$\overline{C}$	_ dB	土
NONE	5.2.15	DATA SHE	et Summary		$\circ$	60	
		(PASS/FA)	IL)		<u> </u>	(DP)	
SHONON CO		N				CAGE: 6Y858	
7 HERMAN						TEL: 203-651-	
SIMSBURY,	CT 0607	0				FAX: 203-651-	8618
-							

```
FILE=29C8803A.DAT 08:58:23 10-28-1997
PN_100830_824 FINAL_FUNCTIONAL TEMP:C FLIGHT3_FUNCT3 /N DUAL_SXX
19-23-1397 HP8753, SSCF, SSFFIX, SSREF
FREQUENCY (MHZ): CENTER= 300.2 WIDTH= 39.84
                                             INCR. = .12 SYSTEM BANDWIDTH= 12
                               PHASE (DEG) = -8080.462 DELAY (US) = 0 SLOPE (US/NHZ) = 0
REFERENCES: LOSS(DB) = 28.45777
9MS ERRORS: LOSS(DB) = 9.661485E-82 PHASE(DEG) = 1737.076
  DT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED 3.984 MHZ/DIV
FORE IG. DB/DIA
LOSS-4-DB/BIV-
FREU 3.984 NHZ/DIU
PEAK: LEVEL (DB) = 28.07163 FREQ (MHZ) = 306.6671 DELAY (US) =-1.383913 SIDELOBE (DB) =-50.78457
ENERGY: LEVEL (DB) = 28.62002 CENTER (MHZ) = 300.4357 WIDTH (MHZ) = 16.15138 SKEW (MHZ) = -6.645541E-82
                                           WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                                  HIX(MHZ)
                     HI (MHZ)
                                CTR(MHZ)
 L(DB)
          LO(MHZ)
                                                                                     0.00000
                                                                                               306.66705
                                                                                                           306.66705
                                                                         0.00000
                                                8.00008
                                                          306.66705
 -8.39
         306.66705
                     306.66705
                                  306.66785
                                                                                   -12.40328
                                                                                               293. 44077
                                                                                                           307.49362
                                                           300.49045
                                                                        14.06942
                                               14.05286
                      387.49362
                                  300.46719
  9.50
         293.44077
                                                                                   -13.70652
                                                                                               233.19470
                                                                                                           387, 66987
                                                           300.48953
                                                                        14.47357
                                               14.47437
                                  300.43188
         293.19470
                      307.66907
  1.00
                                                                                   -15.71887
                                                                                               292.87848
                                                                                                           397.91385
                                               15.03537
                                                           300.44604
                                                                        14.89115
                                  300.39618
  2.00
         292.87848
                      307.91385
                                                           300.44641
                                                                        15.62696
                                                                                   -16,63440
                                                                                               292.66721
                                                                                                           308.11038
                                               15.44318
                      308.11038
                                  380.38879
  3.88
         292,66721
                                                          300.44568
                                                                                               292.48895
                                                                        15.24409
                                                                                   -18.85284
                                                                                                           308, 26031
                                               15.77136
                      308.26031
                                  300.37463
  4.00
         292, 48835
                                                                                               292.34415
                                                                                                           388.38889
                                                                        15.32590
                                                                                   -20.10944
                                               16.04474
                                                           388.44445
                      308.38889
                                  300.36652
  5.00
        292.34415
                                                                                               292.22247
                                                                                                           308.50037
                                                                        15.39121
                                                                                   -21.49482
                                                           300, 44305
                                               16.27789
                                  300.36142
  5.00
         292,22247
                      308.50037
                                                                                   -26.43457
                                                                                               291.84964
                                                           300.43924
                                                                        15.58695
                                                                                                           308.86328
                                               17.01364
                                  300, 35645
  10.00
         291.84964
                      308.86328
                                                                        15.55562
                                                                                   -37.96266
                                                                                               291.24100
                                                                                                           389.44934
                                                           300.43616
                                               18.20834
                      309.44934
                                  300.34515
  20.00
         291.24100
                                                                                  -48. 90445
                                                                                               290.79880
                                                                                                           309.84351
                                               19.04471
                                                           300.43570
                                                                        15.55883
                                  300.32117
         290,79880
  30.00
                      309, 84351
                                                                        15.55904 -55.53081 290.44385
                                                                                                           310.12030
                                                           300.43567
                                               19.67645
                                  300.28207
         298, 44385
                      310, 12038
  40.00
             294,200
                       306,200
 BAND (MHZ)
 LMIN(DB)
                   -8, 29
 LMAX (DB)
                    9.18
 LDEL (DB)
                    0.48
 PMIN(DEG)
                -2976.83
                 2981.22
 PMAX (DEG)
```

PDEL (DEG) 5958.05
File: 2AC8B03A.DAT Passband Symmetry = 0.2 dB

```
FILE=2008803A.DAT 708:59:43 10-28-1997
 PN 199839_824 FINAL_FUNCTIONAL TEMP:C FLIGHT3_FUNCT3 /N DUAL_SXX
 10-23-1997 HP8753, SSCF, SSFFIX, SSREF
 FREDUENCY (MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
 REFERENCES: LOSS(DB) = 28.97806 PHASE(DEG) = -22734.77 DELAY(US) = 8 SLOPE(US/MHZ) = 8
 RMS ERRORS: LDSS(DB)= .221858 PHASE(DE6)= 1715.118
   OT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS.
                                                 FREQ 3.984 MHZ/DIV
 FORE IG. DB/DLA
                                  LOSS-1-DB/BIU--
FREG 3.984 MHZ/DIU
PEAK: LEVEL(DB) = 28.54077 FREQ(MHZ) = 339.4977 DELAY(US) =-1.375975 SIDELOBE(DB) =-45.88854
ENERGY: LEVEL(DB) = 29.18458 CENTER(MHZ) = 343.9922 WIDTH(MHZ) = 16.2153 SKEW(MHZ) = .3855571
 L(DB)
          LO(MHZ)
                     HI (MHZ)
                               CTR (MHZ)
                                          WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                                 HIX (MHZ)
 -0.44
         339.49771
                     339.49771
                                 339, 49771
                                               0.99999
                                                         339, 49771
                                                                       8.00000
                                                                                             339.49771
                                                                                   0.00000
                                                                                                          339.49771
  0.50
         337.18463
                     350.69611
                                 343.94037
                                              13.51147
                                                         343.79486
                                                                      13.53075
                                                                                 -11.36506
                                                                                             337.18463
                                                                                                          350.69611
  1.00
         336.93463
                     351,27496
                                 344.10480
                                              14.34033
                                                         343.90799
                                                                      14.14272
                                                                                 -12.88154
                                                                                             336, 93463
                                                                                                          351.27496
 2.00
         336.63333
                    351.64612
                                 344.13971
                                              15.81279
                                                         343.96036
                                                                      14.73372
                                                                                 -15.34571
                                                                                             336. 63333
                                                                                                          351.64612
  3.00
         336, 42117
                    351.88885
                                 344.15503
                                                                      14.93089
                                              15.46768
                                                         343.99414
                                                                                 -15.63640
                                                                                             336.42117
                                                                                                          351.88885
  4.00
         336, 24869
                    352,08023
                                 344. 16443
                                              15.83163
                                                         343.96756
                                                                      15.09299
                                                                                 -19.15788
                                                                                             336.24860
                                                                                                          352.08023
  5.00
         336.11166
                     352,23260
                                 344.17212
                                              16.12094
                                                         343.97043
                                                                      15.17968
                                                                                 -19, 26129
                                                                                             336.11166
                                                                                                          352, 23260
  6,00
         335, 98969
                     352.37668
                                 344.18317
                                              16.38699
                                                         343.99057
                                                                      15.28146
                                                                                 -21.15227
                                                                                             335.98969
                                                                                                         352.37668
 10.00
         335,60181
                     352.79132
                                 344.19656
                                                                      15.40173
                                              17.18951
                                                         343.99875
                                                                                 -25.75460
                                                                                             335.60181
                                                                                                          352.79132
 20.00
        334.97394
                     353.44586
                                 344.20990
                                                                      15.45837
                                              18.47192
                                                         343.99277
                                                                                 -37.43365
                                                                                             334.97394
                                                                                                         353.44586
 39.00
         334,54675
                     353.87585
                                 344.21130
                                              19.32910
                                                         343.99219
                                                                      15.46180
                                                                                 -46.57365
                                                                                             334.54675
                                                                                                         353.87585
 40.00
         334.03793
                     354.19659
                                 344.11725
                                              20.15866
                                                         343.99216
                                                                      15.46214
                                                                                 -52, 55842
                                                                                             334.03793
                                                                                                         354.19659
BAND (MHZ)
            338,200
                     350,200
LMIN(DB)
                  -0.43
LMAX (DB)
                   0.42
LDEL (DB)
                  0.85
PHIN (DEG)
               -2938, 72
PMAX (DEG)
               2943.91
```

PDEL (DEG)

5882.64

File: 2008803A.DAT Passband Symmetry = 0.3 dB

# ELECTRICAL TEST DATA SHEET

		TITLE: Jest DATE:	12/23/	TIM	E: <u>Sharpm</u>	
TEST: FIN			,			
EQUIPMENT			_	DUE: 12		
	HP 34	78A SERIAL: 2136A03127	CAL	DUE: 7/	7/98	
PARAGR	APH	REQUIREMENT TITLE		DATA		P
REQ.	Q/ATP					
		OPERATING TEMPERATURE		14.9	С	_
		CENTER FREQUENCY &				_
3.2.1.4		CENTER FREQUENCY STABILITY				
		LO: 299.335/301.065 MHz		300.270	MHz	
		HI: 343.335/345.065 MHz		344.030		-
3.2.1.5	5.2.4	3 dB BANDWIDTH:				
		LO: 15/16 MHz		15.438	MHz	-
		HI: 15/16 MHz		15.468		-
3.2.1.6	5.2.5	PASSBAND SYMMETRY				
		LO: /0.5 dB		0.1	₫₿	-
		HI: /0.5 dB		0.3	dB	-
3, 2, 1, 7	5.2.6	PASSBAND RIPPLE			<b>_</b>	
4.2.3.	0.2.0	294.2-306.2 MHz: /1.0 dB		0.5	dB	-
		338.2-350.2 MHz: /1.0 dB		0.7	dB	-
3.2.1.8	5 2.7	INSERTION LOSS			<b></b>	-
J. L. 11.0	J. L. 1	LO: 27.8/30.2 dB		28.6	dB	
		HI: 27.8/30.2 dB		28.9	dB	-
7 2 1 0	529	INSERTION LOSS VARIATION		E0. 7	_ 65	-
3. (. 1. )	J. L. U	LO: -0.4/0.4 dB		0.0	dB	
		HI: -0.4/0.4 dB		0.0	_ dB	-
7 2 1 10	529	AMPLITUDE BALANCE			- 52	-
3.2.1.10	J. L. 3	LO, HI: /0.5 dB		0.2	dB	_
7 2 1 11	5 2 10	OUT-OF-BAND REJECTION		0, 5	_ 05	-
J. L. I. II	J. L. 10		PEAK (d	ום	WIDTH(MHz)	
		WIDE: 1-286,359-1000 MHz:	43.8	<i>U</i> /	0.000	
		DUAL: 286.000-288.935,	40. C	_		
		311.465-332.935,				
		355.465-359.00 MHz:	45.5		0.000	
		PEAK: 35.0/ dB	43.8	dB		
		WIDTH: /3.2 MHz	40.0	05	0.000 MHz	-
7 2 1 12	5 2 11	SHAPE FACTOR				-
3. 2. 1. 10	J. E. 11	LD: /1.30 Unitless		1.27	Unitless	
		HI: /1.30 Unitless		1.30	Unitless	-
7 2 1 14	E 2 12	VSWR (RETURN LOSS)			_ 0,1141633	-
3.6.1.14	J. C. 1C					
		294.2-306.2,338.2-350.2 MHz		17.6	4D	
		DUAL S11: 7.5/ dB DUAL S22: 7.5/ dB		8.8	_ dB	-
4.00	<b>501</b>			0.0	05	-
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS	MT 1_	0.011	MHz	
		CENTER FREQUENCY: -0.2/0.2 M		<u> ۲۰۰۰ م</u> تحری م	PICT 2 MHz	-
		3 dB BANDWIDTH: -0.32/0.32 N	run 2	<u> </u>	_	
NONE	F 2 15	INSERTION LOSS: -0.5/0.5 dB			− dB	-
NONE	2.2.13	DATA SHEET SUMMARY		D	(A)	
		(PASS/FAIL)			را دایــ	
PHONON CO	ידמפחסמדי				CAGE: 5Y858	
7 HERMAN		JIT .			TEL: 203-651-	
	DILLTL	70			FAX: 203-651-	

#### PN 188830\_824 FINAL\_FUNCTIONAL TEMP:R FLIGHT3\_FUNCT3 /N DUAL SXX 10-23-1997 HP8753, SSCF, SSFFIX, SSREF FREQUENCY (MHZ): CENTER= 300.2 WIDTH= 39.84 INCR.= .12 SYSTEM BAYOWIDTH= 12 TFERENCES: LOSS(DB) = 28.65 PHASE(DEG) = 972.4457 DELAY(US) = 0 SLOPE(US/MHZ) = 0 .4S ERRORS: LOSS(DB) = 9.510472E-02 PHASE(DEG) = 1737.789 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED 3.984 MHZ/DIV LOSS, LO. MB/DLA. LOSS-1-DB/EIU---Ι ERS9 3.994 MHZ/IHU PEAK: LEVEL(DB) = 28.28898 FRED(MHZ) = 306.5452 DELAY(US) =-1.384238 SIDELOBE(DB) =-50.85873 ENERGY: LEVEL (DB) = 28.81652 CENTER (MHZ) = 300.3002 WIDTH (MHZ) = 16.14604 SKEW (MHZ) = -3.684266E-02 L(DB) LO(MHZ) HI(MHZ) CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ) HIX(MHZ) -0.36 388.54580 306.54520 306.54520 0.00000 336.54520 0. 00000 **0.00000** 306.54520 396, 54529 0.50 293, 31757 307.36661 320.34210 14.04904 300.35190 14.05571 -12.42358 293.31757 307.36661 1.00 307.54587 293.07474 300.31030 14.47113 300.35110 14.45929 -13.73183 233.07474 307.54587 2.00 -292.75331 307.79340 300, 27835 15.03009 300.34677 14.88825 -15, 28426 292.76331 307.79340 3.00 292.55084 307.98846 300.26965 15.437E2 300.30836 15.01123 -16.67405 292.55084 307.98846 4,00 292.37625 308.13821 300.32875 15.22713 -18.90290 300, 25723 15.76196 292.37525 308.13821 5. CC 232, 23163 308.26721 300.24942 15.30828 -20, 16402 292.23163 16,03558 300.30783 308, 26721 292, 18941 €. 20 308.37894 300.24417 15.26953 300.30887 15.37324 -21.55488 292, 10941 308.37894 12.22 291.73706 308.74133 300, 23920 17.00424 300.30338 15.48749 -26.51933 291.73706 308.74130 -38. 99986 20.20 231, 12888 309.32761 380.22824 18.19873 15**. 5**3528 300.300E3 291.12888 309.32761 39.00 290.68567 303.71988 300.20276 19.03421 300.30020 15.53838 -48.90663 290. 68557 303.71988 15.53859 -55.00367 290.32700 310.00381 40.00 230.32700 310.00381 19,67682 300,30017 300.16541 BAND (MHZ) 234,230 306,230 LMIN(DB) -0.31 LMAX (DB) 8.19 LDEL (DB) 0.51 PMIN (DEG) -2978.39 FHAX (DEG) 2982,53 DEL (DEG) 5960,92

PHONON CORPORATION FILE=28R8803A. DAT 09:19:48 10-28-1997

File: 2ARSB03A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION FILE=2CR8923A.DAT 03:21:19 10-28-1997 PN 188830\_824 FINAL\_FUNCTIONAL TEMP:R FLIGHT3\_FUNCT3 /N DUAL\_SXX 12-23-1997 HP9753, SECF, SSFFIX, SSREF FREQUENCY (MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12 FERENCES: LDSS(DB) = 28.8976 PHASE(DEG) =-13332.93 DELAY(US) = 0 SLCPE(US/MHZ) = 0 .45 ERRORS: LOSS(DB)= .2239998 PHASE(DEG)= 1715.951 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV LOSS TO FE/DIV My Mary Many Many Many Many Many LOSS 1 DB/BIV FREQ 3,994 MHZ/DIV PERK: LEVEL (DB) = 28.4593 FREG (MHZ) = 339.3483 DELAY (US) =-1.372685 SIDELOBE (DB) =-45.28989 ENERGY: LEVEL(DB) = 29.09898 CENTER(MHZ) = 343.8686 WIDTH(MHZ) = 16.20952 SKEW(MHZ) = .3003789 CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ) HIX (MHZ) HI (MHZ) L(D3) LD(MHZ) 0.00000 339.34625 6.66668 339.34625 333, 34625 0.00000 339.34625 339,34625 339.34625 -0.43337.05765 13, 55256 -11.57983350.79678 343.73187 350.79678 343, 92722 13.73914 337.05765 9.58 14.15954 -12.89623 338.81821 351.15018 343.79099 14.33197 351.15018 343.98419 1.00 336.81821 14.74985 -15.36738 336.51978 351,52325 15.00348 343, 84268 351.52325\ 344.02151 2.83 336.51978 14.94550 -16.65349 336.29654 351.76407 343, 87579 15.46753 344.03030 336.29654 351,76407 3.03 336.12576 351.94791 15. 10838 -18.18425 15,82214 343.84857 344.03683 336, 12576 351.94791 4.03 335.98566 352, 10199 16.11633 343.85074 15.19454 -13.29424 344.04382 335.98566 352.10199 5.00 335.88328 352.24500 343.86996 15, 29550 -21, 18332 344.05414 16.38171 335.86328 352, 24500 6.00 -25.78654 15.41495 335.47318 352, 65631 343.86862 17.18314 344.06476 12.22 335, 47318 352.65631 353.30317 15.46998 -36.27317 334.84439 343.85858 18.46478 344.07678 20.00 334,84439 353.30917 334.41599 353.74435 15.47459 -45.57380 343.86865 19.32837 344.05017 39.00 334.41599 353.74435 15.47493 -52.27547 333.89548 354.06628 29, 17081 343.86862 343, 98090 354.06628 40.00 333.89548 BAND (MHZ) 338.200 350.200 LMIN (DB) -0.41 LMAX (DB) 8.41 8,82 LDEL (DB) -2939.31 PMIN(DEG) PMAX (DEG) 2345.04 5885.95 DEL (DEG)

rile: 2CR8E03A.DAT Passband Symmetry = 0.3 dB

```
PHONON CORPORATION
FILE=2ER9B03A.DAT 09:22:37 10-28-1997
 PN_100830_824 FINAL_FUNCTIONAL TEMP:R FLIGHT3 FUNCT3 /N WIDE_521
 10-23-1397 HP8753, SSRSF, SSREF
FREQUENCY (MHZ): CENTER= 500.5 WIDTH= 999 INCR. = . 208125 SYSTEM BANDWIDTH= 999
   FERENCES: LOSS(DB) = 28.7688 PHASE(DE6) = -9529.098 DELAY(US) = 8.685259E-82 SLOPE(US/MHZ) = 0
AS ERRORS: LOSS(DB) = 12.49813 PHASE(DEG) = 7405.112
  LOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV
 FORE, IG. DB/DIA...
FREQ 99 E MHZ/DIÙ
PEAK: LEVEL(DB) = 29.27649 FRED(MHZ) = 306.5159 DELAY(US) =-1.204869 SIDELDBE(DB) =-44.2636
ENERGY: LEVEL(DB) = 28.90917 CENTER(MHZ) = 321.8334 WIDTH(MHZ) = 32.36321 SKEW(MHZ) = 87.92751
                LO(MHZ) HI(MHZ) CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ) HIX(MHZ)
                                                                                    0.00000 306.51593 0.00000 0.00000 306.51593 306.51593
            306.51593 306.51593 306.51593
  -2.43
                                                                                    14.16925 300.41092 14.54825 -17.68515 293.25125 350.63895
   0.50 293.25125 307.42050 300.33588

      0.50
      293.25125
      307.42050
      300.33588
      14.16925
      300.41092
      14.54825
      -17.68515
      293.25125
      330.63895

      1.00
      293.03741
      307.58118
      300.30930
      14.54376
      300.40323
      14.89768
      -17.77492
      293.03741
      351.10892

      2.00
      292.74072
      307.81799
      300.27936
      15.07727
      300.32236
      15.33535
      -17.88972
      292.74072
      351.50906

      3.00
      292.52881
      308.00632
      300.26758
      15.47751
      300.32025
      15.55458
      -17.94788
      292.52881
      351.74805

      4.00
      292.35596
      308.15073
      300.25336
      15.79477
      300.27695
      15.63982
      -17.97000
      292.35596
      351.94217

      5.00
      292.21558
      308.28030
      300.24792
      16.06473
      300.31598
      15.71734
      -17.99031
      292.21558
      352.09567

      6.00
      292.10162
      308.39200
      300.24683
      16.29037
      300.28488
      15.77748
      -18.06608
      292.10162
      352.23724

      10.00
      291.72720
      308.74994
      300.28869
      17.02274
      300.29514
      15.96792
      -18.04293</t
 40.00 290.32364 310.01520 300.16943 19.69156 300.30002 15.97063 -18.04528 290.32364 354.06445
BAND (MHZ) 1.000 286.000 359.000 1000.000
BAND (MHZ)
                         49.33 -0.49
LMIN(DB)
                                                                43.77
                              83.10
                                                  75.03
                                                                103.44
LMAX (DB)
```

9999. 00 9999. 00 4974. 66 16737. 12 16553. 34 TEL (DEG) ILE: 2ERBBB3A.DAT Dut-of-band Rejection: PEAK= 43.8 dB WIDTH= 0.000 MHz

59.67

75.58

5024.34 -6738.12 -6554.34

9999.00 9999.00 9999.00

33.77

LDEL (DB)

PHIN (DES)

FMAX (DEG)

```
FILE=2FR8B03A.DAT 03:23:16 10-28-1997
PN 100830 824 FINAL FUNCTIONAL TEMP:R FLIGHTS_FUNCTS /N DUAL_SXX
10-23-1997 HP8753, SSREF, SSREF
FREQUENCY (MHZ): CENTER= 322.2 WIDTH= 84.96 INCR. = .12 SYSTEM BANDWIDTH= 85
 TFERENCES: LCSS(DB) = 28.7688  PMASE(DE6) = -6105.639  DELAY(US) = .9089838  SLOPE(US/MHZ) = 0
.45 ERRORS: LOSS(DB)= 26.71645 PHASE(DEG)= 1096.566
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 8.496 MHZ/DIV
TOSS, LG, MBADAA
FRES. 8,496, MHZ/DIU
PEAK: LEVEL (DB) = 29.29753 FRED (MHZ) = 306.5566 DELAY (US) = .4341848 SIDELOBE (DB) =-45.27862
EMERGY: LEVEL (DB) = 28.94621 CENTER (MHZ) = 321.4445 WIDTH (MHZ) = 32.32167 SKEW (MHZ) = 1.220756
                                CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ)
                                                                                                   HIX (MHZ)
          LO(MHZ)
                     HI (MHZ)
 L(DB)
                                                          308.55658
                                                                         6.00069
                                                                                     0.00000
                                                                                               306, 55658
                                                                                                           386.55658
                                                0.00000
                                  386.55658
 -0.48
         396, 55658
                     306,55658
                                                                                    -6.33990
                                                                                               293, 25256
                                                          300.33487
                                                                        14.55404
                                                                                                           350, 48154
                                               14.15899
                     307.40955
                                  300.33105
  0.50
         233.25256
                                                                                    -6.42264
                                                                                               293,02954
                                                                                                           351.03778
                                                          300.33533
                                                                       14.95495
                                  300.30557
                                               14.55206
         293.02954
                     307.58160
  1.00
                                                                                    -6.48191
                                                                                               292,73795
                                                                                                           351.48917
                                               15.07341
                                                          300.33270
                                                                        15.29812
                                  300.27765
  2.00
                     307.91735
         232.73735
                                                                                               292.52853
                                               15.47961
                                                          300.29913
                                                                       15, 48963
                                                                                    -E.51287
                                                                                                           351.73462
                                  300, 26834
         292, 52853
                      308.20815
  3.00
                                                                                    -6.52354
                                                                                               232,35348
                                                                                                           351.92838
                                               15.79529
                                                          300.30051
                                                                       15, 50030
  4.00
                                  388, 25684
         232, 35840
                      308, 15369
                                                          300.32053
                                                                                    -5.54347
                                                                       15.73141
                                                                                               232,21613
                                                                                                           352.09279
                                               16.06548
                      328.28152
                                  300.24884
  5.00
         232.21513
                                                                        15.76827
                                                                                    -6.53940
                                                                                               292.09575
                                                                                                           352, 22824
                                                          300.30154
                                  300, 24390
                                               16.29626
  €.00
         292.09576
                      389. 39203
                                                                                    -6.53220
                                                                                               231.72748
                                                                                                           352.64655
                                                          300.30136
                                                                        15.90446
                      308.75046
                                  300, 23895
                                               17.02238
 10.00
         291.72748
                                                                                                           353.30310
                                                                       15.96494
                                                                                    -€.47312
                                                                                               291.12234
                                                          300, 30045
                                               18.21126
         231, 12234
                      333, 33340
                                  300, 22767
 20,00
                                                                                    -6.41981
                                                                                                           353, 73889
                                                          300.30023
                                                                        15.56937
                                                                                               298.67957
                                               19.04633
         290.67957
                      303,72589
                                  320, 28273
 30.00
                                                                                    -6.37791 290.32410
                                                          300.30017
                                                                       15.96959
                                                                                                           354.06119
                                               19.68134
 43, 23
          290.32410
                      310.00543
                                  300, 16476
                                 338.200 350.200
BAND (MHZ)
             294.200
                      336, 230
                                       -0.35
LMIN(DE)
                   -0.41
                             -0.47
                                        0.53
                             72.55
LMAX (DB)
                    8.28
                                        e.88
LDEL (DB)
                    0.49
                             73.02
                                     -£38.51
FMIN (DEG)
                -1482.14 -2243.94
                          2031.60
                                     1300.40
FMAX (DEG)
                  531.21
                 2013.35 4335.53 1938.91
 DEL (DEG)
```

FILE: 2FR2803A.DAT Out-of-band Rejection: PEAK= 45.5 dB WIDTH=

PHONON CORPORATION

FILE: 2FR8303A.DAT (+SSCF)

PN\_100830\_024 FINAL\_FUNCTIONAL TEMP:R FLIGHT3\_FUNCT3 /N DUAL\_SXX 10-23-1997 HP00753, SSREF, SSREF, SSCF REFERENCES: LOSS(D3) = 28.7688 PHASE(DEG) = -6105.639 DELAY(US) = .9089838 SLDPE(US/MHZ) = 0

3ANDPESS	CHARACTERISTICS	MEASUREMENT

FREQUENCY (MHZ)	LOSS (DB)	PHASE (DES)
285.420	57.73	455. 49
293.093	62.27	1251.64
<b>292.</b> 750	1.89	781 <b>.9</b> 2
296.440	-0.13	156.62
300.120	-0.14	-457.34
303.800	9.07	-1890.64
307.480	<b>8.</b> 78	-1713.83
311.160	52.23	-2243.01
314.840	55.32	-1482.10
318.520	<b>57.96</b>	-574.64
322.200	52.27	624.13
325. 280	52.23	1122.95
323.560	51.27	1547 <b>.0</b> 5
333.240	51.60	2084.44
336. 92 <b>0</b>	<b>0.3</b> 7	1521.57
340.600	-0.03	919.59
344.290	მ. 2მ	319.09
347.9E8	0.44	-282.33
351.640	2.61	-878.40
355.320	54.62	-1112.49
359.000	55.23	-EE7.49

# ELECTRICAL TEST DATA SHEET

DEPO TET I	DART. 17	ELECTRICAL TEST DATA : 31576-2 PHONON PART: 1008		
			10 (23/57) TIME: 6000 cm	
TEST: FI	NOI FIINC	TTONO!	11112. 11112.	
EQUIPMEN	T: HP 87	53D SERIAL:3410A07982	CAL DUE:12/10/97	
		78A SERIAL: 2136A03127	CAL DUE: 7/7/98	
PARAG	RAPH	REQUIREMENT TITLE	DATA	P/F
REQ.	Q/ATP			
3.2.1.1	5.2.1	OPERATING TEMPERATURE	_ <u>35.3</u>	P
3.2.1.3	5.2.3	CENTER FREQUENCY &	<del></del>	
3.2.1.4		CENTER FREQUENCY STABILITY	•	
		LO: 299.335/301.065 MHz	300.158 MHz	Р
		HI: 343.335/345.065 MHz	343.916 MHz	P P
3.2.1.5	5.2.4	3 dB BANDWIDTH:		
		LO: 15/16 MHz	15.432 MHz	<u>p</u>
		HI: 15/16 MHz	15.464 MHz	P P
3.2.1.6	5.2.5	PASSBAND SYMMETRY	<del></del>	
		LO: /0.5 dB		p
		HI: /0.5 dB	0.3 dB	<del>p</del>
3.2.1.7	5.2.6	PASSBAND RIPPLE	************	_
		294.2-306.2 MHz: /1.0 dB	<b>0.4</b> dB	Р
		338.2-350.2 MHz: /1.0 dB	0.6 dB	<u>b</u>
3.2.1.8	5.2.7	INSERTION LOSS		
		LO: 27.8/30.2 dB	28.9 dB	р
	HI: 27.8/30.2 dB	28.8 dB	<u>p</u>	
3.2.1.9		INSERTION LOSS VARIATION		<u> </u>
		LD: -0.4/0.4 dB	<u>0.2</u> dB	P
		HI: -0.4/0.4 dB	-0.0 dB	<u>р</u>
3.2.1.10	5, 2, 3	AMPLITUDE BALANCE	<del></del>	<u> </u>
		LO, HI: /0.5 dB	_0.0 dB	P
3.2.1.11	5, 2, 10	OUT-OF-BAND REJECTION		÷
	0.2.10	BAND	PEAK(dB) WIDTH(MHz)	
		WIDE: 1-286,359-1000 MHz:		
		DUAL: 286.000-288.935,		
		311.465-332.935,		
		355.465-359.00 MHz:	45.3 0.000	
		PEAK: 35.0/ dB	44.1 dB	Р
		WIDTH: /3.2 MHz	0.000 MHz	Þ
3.2.1.12	5.2.11	SHAPE FACTOR		<u> </u>
0		LO: /1.30 Unitless	1.28 Unitless	Þ
		HI: /1.30 Unitless	1.30 Unitless	<u>p</u>
3.2.1.14		VSWR (RETURN LOSS)		<u> </u>
J. L. 1. 17	J. C. IC	294.2-306.2,338.2-350.2 MH	-	
		DUAL S11: 7.5/ dB	17.0 d3	Ð
	DUAL S22: 7.5/ dB	8.5 dB	<del></del>	
4.8.2	5 2 14	LIMITED FUNCTIONAL TESTS		<u>~</u>
7.0.6	J. E. 14	CENTER FREQUENCY: -0.2/0.2	MHz C MHz	P
		3 dB BANDWIDTH: -0.32/0.32		iP
		INSERTION LOSS: -0.5/0.5 di		44000
NONE	5 2 15	DATA SHEET SUMMARY		<b>—</b>
NONE	3. 2. 13		D GO	
		(PASS/FAIL)	<u> </u>	
SHONON CO	POORATIO	ni	CAGE: 6Y858	
7 HERMAN		<i>3</i> 13	TEL: 203-651-	<b>0211</b>
SIMSBURY,		ra	FAX: 203-651-	
	U. 8087	•	1 100 CCO 001 (	

```
PHONON CORPORATION
      "E=29H9B23A.DAT 09:42:01 10-28-1997
       100830 BE4 FINAL FUNCTIONAL TEMP:H FLIGHT3_FUNCT3 /N DUAL_SXX
    12-23-1997 HP8753, SSCF, SSFFIX, SSREF
    RECUENCY (PHZ): CENTER= 300.2 WIDTH= 39.84 INCR. = .12 SYSTEM BANDWIDTH= 12
    REFERENCES: LOSS (DB) = 28.89006
                                    PHASE (DEG) = 5202.996 DELAY (US) = 0 SLOPE (US/MHZ) = 0
    RMS ERRORS: LOSS(DB) = 9.136671E-02 PHASE(DEG) = 1738.449
    PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV
                                                VS. FREQ 3.984 MHZ/DIV
    LOSS TO DEZDIV
    LOSS 4 DBABIU
   FREE 3 .984 MIZ/DIV
   PEAK: LEVEL(DB) = 28.55986 FREQ(MHZ) = 306.4265 DELAY(US) =-1.384836 SIDELDBE(DB) =-50.43873
   ENERGY: LEVEL(DB) = 29.05861 CENTER(MHZ) = 300.1567 WIDTH(MHZ) = 16.14074 SKEW(MHZ) =-2.026192E-03
   L(DB)
             LD(MHZ)
                                  CTR(MHZ) WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LOX(MHZ) HIX(MHZ)
                        HI (MHZ)
    -8.33
            386.42651
                        308.42851
                                    306.42651
                                                  0.02000
                                                             306, 42651
                                                                          0.02030
                                                                                       0.00220
                                                                                                 306, 42651
                                                                                                              306, 42651
     3.53
            293, 19342
                        307.24475
                                    300.21909
                                                  14.25133
                                                             300.21033
                                                                          14.04903
                                                                                     -12.43979
                                                                                                 293, 19342
                                                                                                              307.24475
     1.00
            232, 35323
                        307.42703
                                    320, 19312
                                                  14, 46780
                                                             300.21021
                                                                          14.45248
                                                                                     -13,75468
                                                                                                 232, 95923
                                                                                                              307, 42703
     2.00
           292,65121
                        307.67804
                                    300.16461
                                                 15.02688
                                                             300.20706
                                                                          14.73297
                                                                                     -15.31478
                                                                                                 292.65121
                                                                                                             307.67984
     3.00
           292,44177
                        307.87338
                                    300.15759
                                                  15.43181
                                                             300.17041
                                                                          15.00310
                                                                                     -16.70984
                                                                                                 292,44177
                                                                                                             327.87338
           292,26730
     4.00
                       308.02307
                                    300.14520
                                                 15.7557?
                                                             320, 17159
                                                                          15.21818
                                                                                     -18.95151
                                                                                                 292, 26730
                                                                                                             328, 92327
     5.00
           292, 12321
                        308, 15125
                                    300.13751
                                                 16.02744
                                                             300, 17145
                                                                          15.29884
                                                                                     -28, 22844
                                                                                                 292, 12381
                                                                                                             308, 15125
    5.23
           292, 22195
                        308.26218
                                    300.13208
                                                 16.26022
                                                             300.17030
                                                                          15.36304
                                                                                     -21.61810
                                                                                                 292,00195
                                                                                                             328, 26218
    10.00
           291.63249
                        308. E2521
                                    300.12787
                                                 15.93472
                                                             300.18904
                                                                          15, 47623
                                                                                     -26, 61302
                                                                                                 291.63049
                                                                                                             308.62521
   20,00
           291.82142
                        309.20905
                                                             300.15711
                                    300.11523
                                                 18.18752
                                                                          15,52306
                                                                                     -38.24784
                                                                                                 231.02142
                                                                                                             303.20905
   30.00
           290.57312
                       309.59500
                                    300.08405
                                                 13.02183
                                                             300.15578
                                                                          15.52605
                                                                                     -48, 99274
                                                                                                 230.57313
                                                                                                             309,59500
   40.00
           292,21198
                        309.89456
                                    300, 05328
                                                 19.68259
                                                            300.16675
                                                                          15, 52525
                                                                                     -54.88008
                                                                                                 290, 21198
                                                                                                             303.83456
   Band (MHZ)
              234.200
                        306, 200
  LMIN(DB)
                     -0.2E
    193 (28)
                     8.19
    JEL (DB)
                     0.45
   "IN (DEG)
                 -2979.67
( AX (DEG)
                  2993, 92
  FEEL (DEG)
                  5963.49
  File: 2AMBB03A.DAT Passband Symmetry = 0.1 dB
```

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E=2CH8E03A.DAT 09:43:21 10-28-1997
       100830 824 FINAL FUNCTIONAL TEMP:H FLIGHT3 FUNCT3 /N DUAL SXX
10-23-1997 HP8753, SSCF, SSFFIX, SSREF
  REGUENCY (MHZ): CENTER= 344.2
                                                                   WIDTH= 39.84 INCR. = .12 SYSTEM BANDWIDTH= 12
 REFERENCES: LDSS(D8) = 28.84936
                                                                   PHASE(DEG)=-9471.255
                                                                                                                    DELAY(US) = 0 SLCFE(US/MHZ) = 0
                                                                     PHASE (DEG) = 1716.711
 RMS ERRORS: LOSS(DB)= .2215999
 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS.
                                                                                                    FRED 3.984 MHZ/DIV
 LOSS TO DB/DIV
                                                                The series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of the series of th
 LOSS 4 DB/PIU -
                                                                T
 FREG 3.984 MMZZENU
 PEAK: LEVEL(DB) = 28.41407 FRED(MHZ) = 339.1938 DELAY(US) =-1.373398 SIDELDBE(DB) =-45.43355
 EMERSY: LEVEL (DB) = 29.04476 CENTER (MHZ) = 343.7561 WIDTH (MHZ) = 16.20261 SKEW (MHZ) = .2956218
                                                                                        NID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DE) LOX(MHZ)
                                                                  CTR(MHZ)
                                                                                                                                                                                                          HIX (MHZ)
   L(DB)
                     LO(MHZ)
                                             HI (MHZ)
                                                                                                                                                                              0.00000
                                                                                                                                                                                                  339.19382
                                                                                                                                                                                                                            339, 19382
                                                                                                                        339.19382
                                                                                                                                                     0.22000
                    239, 19382
                                             333, 19382
                                                                      339, 19382
                                                                                                   0.00000
    -3.44
                                                                                                                                                                          -11.84870
                                                                                                                                                                                                   336.93842
                                                                                                                                                                                                                            350,68607
                                                                      343, 81226
                                                                                                 13,74765
                                                                                                                        343,67035
                                                                                                                                                    13.77727
     0.50
                    336,93842
                                             350. E9E07
                                                                                                                                                                                                   338.71991
                                             351.03586
                                                                      343.87787
                                                                                                 14.31595
                                                                                                                        343.67590
                                                                                                                                                   14.17880
                                                                                                                                                                          -12.91387
                                                                                                                                                                                                                            351.03586
     1.30
                    336,71991
                                                                                                 14.99249
                                                                                                                                                   14,63428
                                                                                                                                                                          -14.96733
                                                                                                                                                                                                   336.41430
                                                                                                                                                                                                                            351.40649
                                                                                                                        343.76839
     2.20
                    33E. 41400
                                             351.40849
                                                                      343.91025
                                                                                                                                                                          -15.69384
                                                                                                                                                                                                   336.18436
                                                                                                                                                                                                                            351.64795
                                                                                                                                                   14.96532
                                                                      343.91614
                                                                                                 15.46359
                                                                                                                        343,76273
      3.00
                    336, 18436
                                             351.64795
                                                                                                                                                                                                   336, 01367
                                                                                                                                                    15, 12590
                                                                                                                                                                          -18.21922
                                                                                                                                                                                                                            351.82538
                                                                                                                        343,73590
     4.00
                    336.01367
                                             351.82538
                                                                      343.91953
                                                                                                 15,81171
                                                                                                                                                                          -19.32874
                                                                                                                                                                                                   335.87161
                                                                                                                                                                                                                            351.98322
                                             351.98322
                                                                                                                                                    15.21144
      5.20
                    335.87161
                                                                      343, 92743
                                                                                                 15.11160
                                                                                                                        343.73819
                                                                                                                                                    15.31209
                                                                                                                                                                          -21,22972
                                                                                                                                                                                                   335, 75049
                                                                                                                                                                                                                            352, 12433
                                                                      343.93741
                                                                                                 1E.37384
                                                                                                                        343.75754
     6.00
                    335.75049
                                             352, 12433
                                                                                                                                                                          -25, 83394
                                                                                                                                                                                                   335.35565
                                                                                                                                                                                                                             352, 53159
                                                                                                                                                    15, 43032
                                                                      343.94360
                                                                                                 17, 17593
                                                                                                                        343.75632
    10.00
                    335.35565
                                             352,53159
                                                                                                                        343.75620
                                                                                                                                                                          -38, 30404
                                                                                                                                                                                                   334.72360
                                                                                                                                                                                                                            353, 18359
                                                                                                                                                    15, 48475
                                                                                                 18, 45399
    23.00
                    334.72388
                                             353, 18359
                                                                      343.95361
                                                                                                                                                    15.48934
                                                                                                                                                                          -45. ££121
                                                                                                                                                                                                   334, 29249
                                                                                                                                                                                                                            353, 62585
                                                                                                                        343.75619
    30.88
                    234, 29248
                                             353. £2585
                                                                      342, 95917
                                                                                                 19.33337
                                                                                                                                                                                                   333.76270
                                                                                                                                                                                                                            353, 92856
                                                                                                                                                    15.48368
                                                                                                                                                                          -52.55684
                                                                                                 20.16585
                                                                                                                        343.75607
    43.89
                    333,75278
                                             353. 32856
                                                                      343.84564
  BAND (MHZ)
                          338,200
                                               350.288
                                       -0.43
  LMIN(DB)
     'AX (DE)
                                         8.37
      A (00)
                                         0.88
  PHIN(DES)
                                 -2940.5E
    /AX (DEG)
                                   2945.52
  POEL (DES)
                                   5837.08
```

Passband Symmetry = 0.3 dB

File: 2CHS203A.DAT

# **Channel 13 Bandpass Filter**

SAW Filter (S/N: 1331576-3, S/N: B06)

## FLECTRICAL TEST DATA SHEET

		ELECTRICAL TEST DATA S		
		31576-3 PHONON PART: 1888		
TESTED BY	Y: 21	J IIILE: Teat feet DATE:	5/12/99 TIME: 11:00 Am	
TEST: FIN	HL FUNC	FZD CCDIOL-2440004274	POL THE 4 200 /00	
FROTHER	ונות. אכרתווו	53D SERIAL: <u>3419094374</u> 78A SERIAL: 2136093127	CAL DUE: 1/29/99	
	UP 34	/OH SERTHE: 2136H8312/	CAL DUE: 7/7/98	
POROGE	SODH	REQUIREMENT TITLE	DATA	P/F
	Q/ATP		<b>2</b> 11111	• • • •
		OPERATING TEMPERATURE	<u>-5.4</u> C	<u>p</u>
		CENTER FREQUENCY &		
3.2.1.4		CENTER FREQUENCY STABILITY	•	
		LO: 312.035/312.365 MHz	312.141 MHz	P
		HI: 332.035/332.365 MHz	332.146 MHz	<u>p</u>
3.2.1.5	5.2.4	3 dB BANDWIDTH:	<del></del>	
		LO: 7.8/8.0 MHz HI: 7.8/8.0 MHz PASSBAND SYMMETRY LO: /0.5 dB HI: /0.5 dB	7.823 MHz	<u>p</u>
		HI: 7.8/8.0 MHz	7.851 MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY		
		LO: /0.5 dB	<b>0.2</b> dB dB	<u>р</u>
			<b>0.</b> 2 dB	<u> P</u>
3.2.1.7	5.2.6	PASSBAND RIPPLE		_
		309.2-315.2 MHz: /1.0 dB	<b>8.3</b> dB	<u>p</u>
		329.2-335.2 MHz: /1.0 dB	<b>0.3</b> dB	<u>p</u>
3.2.1.8	5.2.7	INSERTION LOSS	00.0 17	_
		LO: 27.8/30.2 dB	28. B dB	<u>p</u>
2010		HI: 27.8/30.2 dB	28.8 dB	
3.2.1.9	5.2.8	INSERTION LOSS VARIATION	מר כים	<u>p</u>
		LO: -9.4/9.4 dB	<u>−8.2</u> dB <u>−0.2</u> dB	+
2 2 4 40	E 2 D	HI: -0.4/0.4 dB AMPLITUDE BALANCE	<u>~6.2</u> 05	<u> </u>
3.2.1.10	3. 2. 9	LO, HI: /0.5 dB	<b>0.0</b> dB	р
7 2 1 11	5 2 10	OUT-OF-BAND REJECTION	<u>0.0</u> us	<u>-</u>
3. C. 1. 11	J. C. 10	BAND	PEAK (dB) WIDTH (MHz)	
		WIDE: 1-303,342-1000 MHz:		
		DUAL: 383.000-306.835,		
		317.565-326.835,		
		337.565-342.00 MHz:	42.8 <b>0.90</b> 0	
		PEAK: 35.0/ dB	42.8 dB	Р
		WIDTH: /1.6 MHz	0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR		
		LO: /1.30 Unitless	1.28 Unitless	<u> </u>
		HI: /1.30 Unitless	1.27 Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)		
		309.2-315.2,329.2-335.2 MH	z	
		DUAL S11: 7.5/ dB	<u>10.0</u> dB	
		DUAL S22: 7.5/ dB	<u>9.8</u> dB	<u>p</u>
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS	<u> </u>	0
		CENTER FREQUENCY: -0.1/0.1		1
		3 dB BANDWIDTH: -0.16/0.16		*
		INSERTION LOSS: -0.5/0.5 d	$B \longrightarrow dB$	#
NONE	5.2.15	DATA SHEET SUMMARY	0 (NP)	•
		(PASS/FAIL)	-1-(V)	
DUONOL CO	00000	<del></del>	DARE. FURER	
PHONON CO		JN.	CAGE: 6Y858	<b>0</b> -144
7 HERMAN	RKIAF		TEL: 203-651-	OCII

PHONON CORPORATION 7 HERMAN DRIVE SIMSBURY, CT 06070

<u>(</u>

CAGE: 6Y858 TEL: 203-651-0211 FAX: 203-651-8618

### FILE=3AC8B06A.DAT 14:32:54 05-12-1998 PN\_100832\_825 FINAL\_FUNCTIONAL TEMP:C FLIGHT6\_3FUNCT /N DUAL\_SXX 85-12-1998 HP8753, SSCF, SSFFIX, SSREF FREQUENCY (MHZ): CENTER= 312.2 WIDTH= 29 INCR.=.1 SYSTEM BANDWIDTH= 6 REFERENCES: LOSS(DB)= 28.83232 PHASE(DE6)=-5843.767 DELAY(US)= 0 SLOPE(US/MHZ)= 0 RMS ERRORS: LOSS(DB) = 8.573858E-82 PHASE(DEG) = 1647.183 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED 2.9 MHZ/DIV FOSS. 18. DB/DLA. LOSS-1-DB/BIV --MMMMMMMMM FREQ 2.9 MHZ/DIV PEAK: LEVEL (DB) = 28,65966 FREQ (NHZ) = 314.4997 DELAY (US) =-2.686285 SIDELOBE (DB) =-44.45791 ENERGY: LEVEL (DB) = 29.8311 CENTER (MHZ) = 312.1744 WIDTH (MHZ) = 8.288358 SKEW (MHZ) =-4.966622E-82 WID (MHZ) AV-CTR (MHZ) AV-HID (MHZ) AV-SL (DB) LDX (MHZ) HIX (MHZ) LO (MHZ) HI (MHZ) CTR (MHZ) 0.00 314,49973 -0.17 314.49973 314.49973 314, 49973 **0.00000** 314.49973 0.00000 314.49973 6.97968 0.58 388.65982 315.69141 312.17568 7**. 6**3159 312, 18292 -14.12 **388.6598**2 315.69141 312.22321 312.15497 7.29324 7.23368 -15.61 **398.5983**3 1.00 368.56833 315.80157 315, 80157 7.68449 312.18271 7.44997 -17.49 388.34918 315. 95367 2.98 388.34918 315.95367 312.15143 7.82254 7.56522 398.22986 312.18216 -18.99 316.05240 3.00 388, 22986 316, 65240 312.14111 -29.76 7.98776 7.65615 312.18045 388, 14468 316. 13245 4.00 388, 14468 316. 13245 312.13855 5.00 388.07251 316.20380 312.13815 8.13129 312.17865 7.72316 -22, 79 398, 97251 316, 20380 7.72316 -22,76 316.26862 312.13913 8, 25897 312, 17865 388.98964 316, 26862 6.00 308, 00964 7.79963 8.65225 312.17633 -27.81 307.80646 316, 45871 307.80646 316.45871 312.13257 10.00 7.83158 -48.21 387.49643 312.13712 9.28137 312.17377 316,77780 28.98 387, 49643 316.77788 7.83389 -47.12 397,29834 38.00 387, 29834 316.96558 312, 13196 9.66724 312.17407 316.96558 7.83321 **-48.59 307.14081** 48.90 307.14081 317.16711 312. 15396 10.02631 312.17410 317.16711 BAND (MHZ) 309.200 315.200 LMIN(DB) -0.17 LMAX (DB) 8.15 LDEL (DB) 0.32 PMIN(DEG) -2886.78PMAX (DE6) 2981.61 PDEL (DEG) 5708.39

PHONON CORPORATION

File: 3AC8B06A, DAT

Passband Symmetry = 0.2 dB

### FILE=3CC8B06A. DAT 14:33:49 05-12-1998 PN\_100832\_825 FINAL\_FUNCTIONAL TEMP:C FLIGHT6\_3FUNCT /N DUAL\_SXX 05-12-1998 HP8753, SSCF, SSFFIX, SSREF FREQUENCY (NHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6 REFERENCES: LOSS(DB) = 28.79356 PHRSE(DEB) = -15342.11 DELAY(US) = 0 SLDPE(US/MHZ) = 0 RMS ERRORS: LOSS(DB)= .1013191 PHASE(DEG)= 1627.012 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV FORE LG. DB/DLA. LOSS-1-DB/BIV ---FREG 2.9 MHZ/DIU PEAK: LEVEL(DB) = 28.59534 FREQ(MHZ) = 334.416 DELAY(US) = -2.650382 SIDELDBE(DB) = -43.04966 ENERGY: LEVEL (DB) = 28, 97694 CENTER (NHZ) = 332, 1737 WIDTH (NHZ) = 8, 224448 SKEW (NHZ) = -4, 889898E-62 CTR (MHZ) NID (MHZ) AV-CTR (MHZ) AV-NID (MHZ) AV-SL (DB) LOX (MHZ) HIX (MHZ) L(DB) LO(MHZ) HI (MHZ) -0.20 334.41599 334.41599 334, 41599 **6.0000**0 334.41599 0.00000 0.00 334.41599 334.41599 7.11093 0.50 328, 59702 335, 70795 332, 15247 332, 17783 7.18710 -14.92 328.59782 335, 70795 7.34946 332.17615 7.35002 1.99 328, 46155 335.81100 332.13629 -16.01 328, 46155 335.81198 328, 32263 335.97549 332.14905 7,65286 332,17480 7.49530 -17.29 328.32263 335, 97549 2.00 328.22828 7.85126 332.17422 7.61563 -18.81 336.07153 3.00 **336.0**7153 332.14598 328.22928 332.17346 7.70989 -28.56 328. 13327 4.00 328, 13327 336. 15265 332, 14294 8.01938 336. 15265 8.16617 332.17249 7.78038 -22.60 336.22803 328.06186 5.00 328.96186 332.14496 336, 22803 8.29379 332.17249 -22.58 328.00269 336, 29648 332.14960 7.78838 328.00269 336, 29648 5.00 7.86889 -27.74 327, 82910 336.48111 332, 15509 8.65201 332.17276 327.82910 336.48111 10.00 9. 26587 332. 17392 7.89333 -48.01 20.00 327.53558 336.80145 332, 16852 327.53558 336.80145 332.15240 9.69946 332.17365 7.89463 -44.54 327.38267 30.00 327.38267 337.00214 337.00214 327.18765 332, 18288 9, 99826 332, 17358 7.89479 -45.62 327.18765 40.00 337.17792 337.17792 BAND (MHZ) 329.200 335.200 LMIN(DB) -0.20 LMAX (DB) 0.28 LDEL (DB) 9.40 PMIN(DEG) -2771.49 PMAX (DEG) 2866.98

PHONON CORPORATION

PDEL (DEG)

5638.48

File: 3CC8B06A.DAT Passband Symmetry = 0.2 dB

ELECT	RICAL	TEST	DATA	SHEET
5-3	PHONON	PART	: 100	1825

AEROJET P	ART: 133	31576-3 PHONON PART: 10082	5 SERIAL:B06	
TESTED BY	: 210	) TITLE: <u>Test lock</u> DATE: 4	5/12/94 TIME: 11:04m	
IEST: LIN	HL PUNL	I LUNHL	•	
EQUIPMENT		530 Serial: <u>3410A04374</u> 78A Serial: <u>2136A03127</u>	CAL DUE: 1/23/33	
	ne sa	TON SERTHLE	CAL DOC: 177736	
Paragr Req.	APH Q/ATP	REQUIREMENT TITLE	DATA	P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	14.9 C	<u>p</u>
	5.2.3	CENTER FREQUENCY &		
3.2.1.4		CENTER FREQUENCY STABILITY LD: 312.035/312.365 NHz	310 (ED MI-	n
		HI: 332.635/332.365 MHz	312.159 MHz 332.160 MHz	<u>p</u>
7215	524	3 dB BANDWIDTH:	332.166 HH2	<u>-</u>
3. 5. 1. 7	J. C. 7	LO: 7.8/8.8 MHz	7.824 MHz	D
		HI: 7.8/8.9 MHz	7.854 MHz	<u>p</u>
3216	525	PASSBAND SYMMETRY		<u> </u>
J. L. 1. U	3	LO: /8.5 dB	0.2 dB	D
		HI: /0.5 dB	0.2 dB	P P
3217	526	PASSBAND RIPPLE		<u>.</u>
J. C. 1. (	J. L. J	309.2-315.2 MHz: /1.0 dB	<b>0.</b> 3 dB	D
		329.2-335.2 MHz: /1.0 dB	<b>6.</b> 3 dB	P
3.2.1.8	5.2.7	INSERTION LOSS		
2121210	01.21	LD: 27.8/30.2 dB	<u>29.0 dB</u>	<u>p</u>
		HI: 27.8/38.2 dB	29.0 dB	Þ
3.2.1.9	5.2.8	INSERTION LOSS VARIATION		
		LO: -0.4/0.4 dB	0.0 dB	P
		HI: -0.4/0.4 dB	0.0 dB	<u>р</u>
3.2.1.10	5.2.9	AMPLITUDE BALANCE		_
		LO, HI: /0.5 dB	0.0 dB	<u>P</u>
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION		_
			PEAK (dB) WIDTH (MHz)	
		WIDE: 1-303,342-1000 MHz:	44.4 0.800	
		DUAL: 303.000-306.835,		
		317 <b>.5</b> 65-326.835,		
		337.565-342.00 MHz:	<u>42.7</u> <b>8.000</b>	
		PEAK: 35.0/ dB	42.7 dB	p
		WIDTH: /1.6 MHz	<b>0.000</b> Miz	<u>p</u>
3.2.1.12	5.2.11	SHAPE FACTOR		
		LO: /1.30 Unitless	<u>1.28</u> Unitless	<u> p</u>
		HI: /1.30 Unitless	<u>1.27</u> Unitless	p
3.2.1.14	5.2.12	VSWR (RETURN LOSS)		
		389.2-315.2,329.2-335.2 MHz		
		DUAL S11: 7.5/ dB	<u>10.4</u> dB	<u>P</u>
		DUAL 522: 7.5/ dB	<u>10. 1</u> dB	<u> P</u>
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS	1 2 221	
		CENTER FREQUENCY: -0.1/0.1		<u></u>
		3 dB BANDWIDTH: -0.16/0.16		<b>K</b>
		INSERTION LOSS: -8.5/8.5 di	+Ord dB	+
NONE	5.2.15	Data Sheet Summary	0 (6)	
		(PASS/FAIL)	<u>+ (D</u> t)	
DIOMO: 00		<b>2</b> VI	ONOT. FUNEN	
PHONON CO		URN	CAGE: 6Y858 TEL: 203-651-	4211
7 HERMAN		70	FAX: 203-651-	
SIMSBURY,	1.1 1000	ľ	LHY! CAD_OTT.	0010

### PHONON CORPORATION FILE=3AR8B06A.DAT 14:47:49 05-12-1998 PN\_100832\_825 FINAL\_FUNCTIONAL TEMP:R FLIGHT6\_3FUNCT /N DUAL\_SXX 85-12-1998 HP8753, SSCF, SSFFIX, SSREF FREQUENCY (MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6 REFERENCES: LOSS (DB) = 29.84878 PHASE (DEG) = -6198.474 DELAY (US) = 8 SLOPE (US/NHZ) = 8 RMS ERRORS: LOSS(DB) = 8.266886E-82 PHRSE(DEG) = 1647.062 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV EXOSS TO DB/DTV LOSS-1-DB/BIV Marylandround FREQ 2.9 MHZ/DIV PEAK: LEVEL(DB) = 28.87538 FREQ(MHZ) = 313.7936 DELAY(US) =-2.691881 SIDELDBE(DB) =-44.35662 ENERGY: LEVEL (DB) = 29, 23862 CENTER (NHZ) = 312, 1893 WIDTH (NHZ) = 8, 200592 SKEW (NHZ) =-4, 676313E-02 WID(MHZ) AV-CTR(MHZ) AV-WID(MHZ) AV-SL(DB) LDX(MHZ) L(DB) LO(MHZ) HI (MHZ) CTR (MHZ) HIX (MHZ) -0.17 313.79358 313.79358 9,00000 313.79358 8.00000 313.79358 313.79358 313.79358 0.00 7.03653 7.07014 0.50 398, 67395 312.22726 -14.60308.67395 315.71048 312.19220 315.71048 7.28745 312.22452 7.23650 308, 52905 315.81650 312.17279 -15.61 388.52985 1.00 315.81650 308.36462 7.45141 388.36462 2.00 315.97153 312.16809 7.68698 312, 18658 -17.48 315.97153 3.00 388.24673 316.07025 312.15851 7.82352 312.18798 7.56798 -18.99 388.24673 316.07025 4.00 308.16156 316, 14963 312.15558 7.98887 312, 18835 7.65841 -20.77 388.16156 316.14963 308.08890 7.72536 5.00 316.22104 312.15497 8.13214 312.18854 -22.88 368.08890 316.22104 388. 82765 312.18854 7.72536 -22.77 388.02765 6.00 316, 28479 312.15622 8.25714 316.28479 -27.84 10.00 397.82385 316.47659 312.15021 8.65274 312.18912 7.80175 307.82385 316.47659 9.28217 7.83249 20.00 307.51297 316.79514 312.15405 312.18909 -38.34 307.51297 316.79514

<i>3</i> 0.00	<i>5</i> 07.31943	316.97916
40.00	307.15411	317.19232
BAND (MHZ)	389.200	315.200
LMIN(DB)	-0.	. 17
LMAX (DB)	8.	. 15
LDEL (DB)	0.	.32
PMIN(DEG)	-2806	. 36
PMAX (DEG)	2901.	. 44
PDEL (DEG)	5707.	88

File: 3AR8B06A.DAT Passband Symmetry = 0.2 dB

312.14929

312.17322

9,65973

10.03821

312.18909

312, 18909

7.83494

7.83513

-46.28

-48.66

307.31943

307.15411

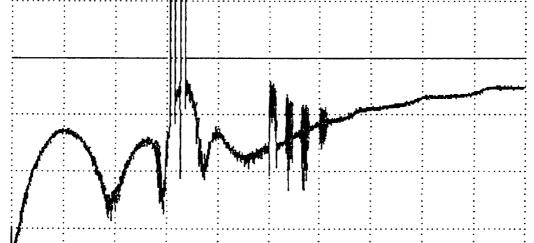
316, 97916

317, 19232

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PHONON CORPORATION
FILE=3CR8B06A.DAT 14:48:53 05-12-1998
PN 188832 825 FINAL FUNCTIONAL TEMP: R FLIGHT6 3FUNCT /N DUAL_SXX
05-12-1998 HP8753, SSCF, SSFFIX, SSREF
FREQUENCY (MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS (DB) = 28, 99485 PHASE (DEG) =-16858, 15 DELAY (US) = 8 SLOPE (US/NHZ) = 8
RMS ERRORS; LOSS(DB) = 9.774687E-82 PHASE(DEG) = 1626.932
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED 2.9 NHZ/DIV
FORE IS DB/DIA.
LOSS-1-DB/DIV --
FREG 2.9 MHZ/DIV
PEAK: LEVEL (DB) = 28.8065 FREQ (MHZ) = 335.2218 DELAY (US) =-2.650909 SIDELOBE (DB) =-42.93839
ENERGY: LEVEL (DB) = 29.17688 CENTER (NHZ) = 332.1854 WIDTH (NHZ) = 8.224468 SKEW (NHZ) =-4.578783E-62
                                            WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                                   HIX (MHZ)
 L(DB)
         LO (MHZ)
                     HI (MHZ)
                                CTR (MHZ)
                                                                     8,99998
                                                                                 0.08
                                                                                        335, 22183
                                                                                                   335, 22183
                                335.22183
                                              6.00000 335.22183
 -8, 19
         335, 22183
                     335.22183
                                              7.11603
                                                                     7.89915 -14.41
                                                                                        328.68297
                                                                                                   335.71899
                                                        332, 22223
  0.50
         328, 68297
                     335.71899
                                332, 16098
                                                                                        328, 47522
                                                                     7.35138 -16.01
                                                                                                   335, 82651
                    335.82651
                                              7.35129
                                                        332, 17691
  1.00
         328, 47522
                                332, 15088
                                              7.65274
                                                                     7.49618
                                                                               -17.29
                                                                                        328.33734
                                                                                                    335, 99008
         328.33734
                    335.99068
                                332, 16370
                                                        332, 17685
  2.00
                                                                                        328, 23355
                                              7.85367
                                                        332, 17822
                                                                     7.61641
                                                                               -18.80
                                                                                                    336.08722
         328.23355
                    336.08722
                               332.16040
  3.00
                                                                     7.71106
                                                                               -20.56
                                                                                        328, 14676
                                                                                                    336, 16644
                               332.15662
                                              8.01968
                                                        332, 17917
         328.14676
                     336.16644
  4.00
                                                                     7.78144 -22.61
                                                                                        328,07626
                                                                                                    336.24179
                                                        332.17975
                     336.24179
                               332.15983
                                              8. 16553
  5.00
         328.07626
                                                                     7.80744 -23.70
                                                        332.19345
                                                                                        328.01791
                                                                                                    336.30923
         328.81791
                     336.38923 332.16357
                                              8.29132
  6.80
                                                                     7.86160 -27.71
                                                                                        327.84161
                                                                                                    336.49673
                                              8.65512 332.18271
 10.90
         327.84161
                     336.49673 332.16919
                                              9.26517
                                                        332, 18555
                                                                     7.89438 -40.21
                                                                                        327.54953
                                                                                                    336, 81470
         327.54953
                    336.81470 332.18213
 26.88
                                              9.69351 332.18533
                                                                     7.89563 -44.85
                                                                                        327.31548
                                                                                                    337.00891
         327.31548
                     337.00891
                               332.16217
 30.00
                                                                     7.89578 -45.97
                                             18.00360 332.18533
                                                                                        327, 19791
                                                                                                    337.20151
                     337.20151
                               332.19971
 40.00
         327.19791
BAND (MHZ)
            329, 200
                    335.200
                  -0.18
LMIN(DB)
LMAX (DB)
                   8.18
LDEL (DB)
                   8.36
PMIN(DEG)
               -2771.30
PMAX (DEG)
                2866.68
 PDEL (DEG)
                5637.98
```

File: 3CR8B86A.DAT Passband Symmetry = 0.2 dB

# PHONON CORPORATION FILE=3ER8886A, DAT 14:49:50 05-12-1998 PN\_100832\_825 FINAL\_FUNCTIONAL\_TEMP:R FLIGHT6\_3FUNCT /N WIDE\_S21 05-12-1998 HP8753, SSREF, SSREF FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR. = ,208125 SYSTEM BANDWIDTH= 999 REFERENCES: LOSS(DB)= 29.01741 PH9SE(DE6)=-34641.38 DELAY(US)= 4.78902 SLOPE(US/MHZ)= 0 RMS ERRORS: LOSS(DB)= 9.295705 PH9SE(DE6)= 5597.914 PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV LOSS 10 DB/DIV



PREQ. 99,9 MHZ/D) V PEAK: LEVEL (DB) = 28.88541 FREQ (MHZ) = 334.3615 DELAY (US) = 6.920135 SIDELOBE (DB) = -43.53982 ENERGY: LEVEL (DB) = 29.20327 CENTER (MHZ) = 322.5316 WIDTH (MHZ) = 16.44444 SKEW (MHZ) = 389.4956

L(DB)	LD(MHZ)	HI (MHZ)	CTR (MHZ)	WID (MHZ) A	V-CTR (MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX (MHZ)	HIX(MHZ)
<del>-0</del> .21	334.36154	334.36154	334.36154	9. 99999	334.36154	9. 00000	0.80	334.36154	334. 36154
<b>0.</b> 50	328.59382	335.73032	332.16168	7.13730	332.24985	7.12829	-20.60	388.67282	335.73032
1.00	328.47141	<b>335.8</b> 3728	332.15436	7.36588	332.15714	7.30530	-20.70	<b>308. 5332</b> 3	<b>335.8</b> 3728
2.00	328.32574	335.9 <del>8</del> 495	332. 15533	7.65921	332.16180	7.68820	-20.85	308.36609	335.98495
3.00	328, 22571	336 <b>. 0</b> 9116	332.15845	7.86545	332.21613	7.71510	-20.91	308.24689	336.09116
4.00	328.14706	336.17654	332.16180	<b>8. 6</b> 2948	332, 16965	7.80480	-20.96	398.16571	336.17654
5.00	328.07941	336.24823	332.16382	8.16882	332.16965	7.80480	-20.96	308.09970	<b>336.248</b> 23
6.00	328.02011	<b>336.3055</b> 4	332.16284	8.28543	332.19928	7.86129	-20.99	<b>388. 63</b> 372	336.38554
10.00	327.83313	336.49783	332.16547	8.66470	332. 18872	7.92382	-21 <b>.6</b> 2	307.82516	336.49783
20.00	327.54736	336.79831	332.17285	9, 25095	332.18356	7.94334	<b>-21.0</b> 3	307.51749	<b>336.798</b> 31
30.00	327.33295	<b>337.0</b> 3369	332.18332	9.70074	332.18378	7.94422	-21.03	307.31543	337.03369
48.00	327.26813	337.20847	332, 23828	9.94034	332, 18384	7.94431	-21.63	307.15579	337.20847

BAND (MHZ) 1.000 303.000 342.000 1000.000 LMIN(DB) 52.41 **-0.21** 44.39 LMAX (DB) 103, 67 61.02 63.24 LDEL (DB) 51.26 61.22 18.85 PMIN(DEG) -7552.33 -7642.31 -5835.55 -5476.81 7298.44 7248.83 PMAX (DEG) 2075.51 14940.75 13884.38 PDEL (DEG)

FILE: 3ER8B06A.DAT Out-of-band Rejection: PEAK= 44.4 dB WIDTH= 0.000 MHz

```
PHONON CORPORATION
FILE=3FR8B06A.DAT 14:50:15 05-12-1998
PN_100832_825 FINAL_FUNCTIONAL TEMP:R FLIGHT6_3FUNCT /N DUAL_SXX
95-12-1998 HP8753, SSREF, SSREF
FREQUENCY (MHZ): CENTER= 322.2 WIDTH= 60 INCR.= .1 SYSTEM BANDWIDTH= 60
REFERENCES: LOSS(DB) = 29.01741  PHASE(DEG) =-10958.83  DELAY(US) = 1.17228  SLOPE(US/NHZ) = 0
RMS ERRORS: LOSS(DB) = 23.46757 PHASE(DE6) = 1677.553
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 6 NHZ/DIV
LOSS TO DB/DIV
 FREQ 6 MHZ/DIV
 PEAK: LEVEL(DB) = 28.8865 FRED(MHZ) = 335.2218 DELAY(US) = -.3863913 SIDELOBE(DB) = -42.93839
ENERGY: LEVEL (DB) = 29.20428 CENTER (WHZ) = 322.28 WIDTH (WHZ) = 16.42383 SKEW (WHZ) =-.1680302
                                           MID (MHZ) AV-CTR (MHZ) AV-NID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                                   HIX(MHZ)
                    HI (MHZ)
                                CTR (MHZ)
 L(DB)
        LD (MHZ)
                                                                                8.90
                                                                                       335, 22183
                                                                                                   335, 22183
                                                                    8. 99999
                    335, 22183
                                335, 22183
                                             9. 99999
                                                       335.22183
        335.22183
 <del>-8</del>.21
                                                                                       388.68589
                                                                                                   335, 72403
                                                                    7.22685
                                                                               -7.94
  9.50 328.59567 335.72483
                              332.15985
                                             7.12836
                                                       332.17743
                                                                    7.39104
                                                                               -8.81
                                                                                       388.53436
                                                                                                   335, 83157
                                                       332.17691
  1.00 328.47031 335.83157
                                332.15094
                                             7.36127
                                                                                       388,36788
                                                                                                   335, 99283
                                                                     7.53662
                                                                               -8.86
                              332, 16382
                                            7.65805
                                                       332, 17685
  2.00
        328, 33478 335, 99283
                                                                                       388.24918
                                                                                                   336. 98945
                                                                     7.65749
                                                       332, 17822
                                                                               -8, 11
        328.23132 336.08945 332.16040
                                            7.85812
  3.80
                                                                     7.75265
                                                                                       398.16333
                                                                                                   336, 16824
                                                                               -8.15
                                                       332.17917
                                332.15659
                                             8.62332
   4.00 328.14493 336.16824
                                                                    7.82341
                                                                               -8.17
                                                                                       308, 09033
                                                                                                   336, 24350
                                                       332, 17975
                                             8, 16879
   5.00 328.07480 336.24350
                                332.15915
                                                                    7.84955
                                                                               -8, 18
                                                                                       388.92988
                                                                                                   336, 31067
                                             B. 29404
                                                       332, 19345
                                332, 16364
         328.01663
                    336.31967
   6.00
                                                                                       387.82483
                                                                                                   336.49765
                                             8.65698
                                                                     7.98481
                                                                               -8.18
                                                       332.18271
                                332.16916
         327.84867
                    336, 49765
  10.00
                                                                                       307.51355
                                                                                                   336.81512
                                                       332, 18555
                                                                     7.93696
                                                                               -8.14
                                              9.26608
                                332.18207
  29.00
         327,54984
                    336.81512
                                                                     7.93822
                                                                               -8.11
                                                                                       387.31982
                                                                                                   337.00949
                                                       332.18533
                                              9.69455
         327.31494
                                332, 16223
  30.00
                    337.00949
                                                                               -8.08 307.15482 337.20178
                                                                     7.93837
                                                       332.18533
                               332.19977
                                             10.00406
                    337.20178
  48.00
         327.19772
            389, 288 315, 288 329, 288 335, 288
 BAND (MHZ)
                                     -0.20
                           -0.11
 LMIN(DB)
                  -0.14
                            55.30
                                     9.16
 LMAX (DB)
                   8. 18
                                      0.36
 LDEL (DB)
                            55.41
                   8.32
               -1997.23 -2168.51 -2066.56
 PMIN(DEG)
                          2127.53
                                  1081.50
 PMAX (DEG)
                2121.11
                3218.34 4296.03 3148.06
 PDEL (DEG)
 FILE: 3FR8B06A.DAT Out-of-band Rejection: PEAK= 42.7 dB WIDTH= 0.000 MHz
```

FILE: 3FR8B06A.DAT (+SSCF)

PN\_100832\_825 FINAL\_FUNCTIONAL TEMP:R FLIGHT6\_3FUNCT /N DUAL\_SXX 05-12-1998 HP8753, SSREF, SSREF, SSCF
REFERENCES: LOSS(DB) = 29.01741 PHASE(DE6) = -10958.83
DELAY(US) = 1.17228 SLOPE(US/MHZ) = 0

# BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY (NHZ)	LOSS (DB)	PHRSE (DEG)
384.680	52.53	2294.91
306.360	52.49	3842.72
308.120	4.55	2766.17
309.880	0.13	1804.16
311.640	<b>0.</b> 12	845.21
313.400	<b>-0.0</b> 2	-113.16
315.160	<b>-6.6</b> 5	-1075.30
316 <b>. 9</b> 20	26.61	-2032.66
318.680	46.70	-1518.77
320.440	46.14	-779.33
322.200	46.81	-34.07
<b>3</b> 23 <b>. 960</b>	46.20	697.98
325.728	44.52	1428,58
327.480	23.27	2008.18
329, 240	<b>-0.0</b> 9	1060.29
331.000	<b>0.0</b> 1	120.60
332.760	<b>-0.6</b> 7	-817.63
334.520	<del>-0</del> .18	-1756.56
336.280	5.52	-2694.77
338. 040	46.94	-2764.92
339.800	45.24	-2027.58

# ELECTRICAL TEST DATA SHEET

AERG 157 B	ART 43	ELECTRICAL TEST DATA S		
		31576-3 PHONON PART: 1008		
TEST: FIN	O FINC	) TITLE: test tach DATE:	5/13/42   IME: 11.00 4m	
EQUIPMENT			CAL DUE:1/29/99	
LUDIFIE)	HP 34		CAL DUE:7/7/98	
Paragr	APH .	REQUIREMENT TITLE	DATA	P/F
REQ.	Q/ATP			
		OPERATING TEMPERATURE	<u>35.5</u> C	P
	5.2.3	CENTER FREQUENCY &		
3.2.1.4		CENTER FREQUENCY STABILITY		
		LO: 312.035/312.365 MHz	312.165 MHz	<u>p</u>
		HI: 332.035/332.365 MHz	332.164 MHz	<u> P</u>
3.2.1.5	5.2.4	3 dB BANDWIDTH:		_
		LO: 7.8/8.0 MHz	7.824 MHz	p p
		HI: 7.8/8.0 MHz	7.854 MHz	<u> p</u>
3.2.1.6	5.2.5	Passband Symmetry		
		LO: /0.5 dB	<u>0.2</u> dB	<u>р</u>
		HI: /0.5 dB	<b>0.</b> 2 dB	<u> P</u>
3.2.1.7	5.2.6	PASSBAND RIPPLE		
		309.2-315.2 MHz: /1.0 dB	<b>0.3</b> dB	<u>р</u>
		329.2-335.2 MHz: /1.0 dB	<b>0.3</b> dB	<u> </u>
3.2.1.8	5.2.7	INSERTION LOSS		
		LO: 27.8/30.2 dB	<u>29.2</u> dB	P P
		HI: 27.8/30.2 dB	29.2 dB	<u>p</u>
3.2.1.9	5.2.8	INSERTION LOSS VARIATION		
		LD: -0.4/0.4 dB	<u>0.2</u> dB	<u> P</u>
		HI: -0.4/0.4 dB	<u>0.2</u> dB	<u>р</u>
3.2.1.10	5. 2. 9	AMPLITUDE BALANCE		_
		LO, HI: /0.5 dB	<b>0.0</b> dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION		
		BAND	PEAK(dB) WIDTH(MHz)	
		WIDE: 1-303,342-1000 MHz:	<u>43.8</u> <b>0.006</b>	
		DUAL: 303.000-306.835,		
		317.565-326.835,		
		337.565-342.00 MHz:	42.9 8.000	_
		PEAK: 35.0/ dB	42.9 dB	<u> P</u>
		WIDTH: /1.6 MHz	0.888 MHz	Р
3.2.1.12	5.2.11	SHAPE FACTOR		_
		LO: /1.30 Unitless	1.28 Unitless	р
		HI: /1.30 Unitless	<u>1.27</u> Unitless	<u> </u>
3.2.1.14	5. 2. 12	VSHR (RETURN LOSS)		
		309.2-315.2,329.2-335.2 MH		_
		DUAL S11: 7.5/ dB	10.7 dB	<u> p</u>
		DUAL \$22: 7.5/ dB	10.2 dB	<u> </u>
4.8.2	5. 2. 14	LIMITED FUNCTIONAL TESTS		<u>alal</u> 044
		CENTER FREQUENCY: -0.1/0.1		4
		3 dB BANDWIDTH: -0.16/0.16		4
		INSERTION LOSS: -0.5/0.5 d	B O dB	F
NONE	5.2.15	data sheet summary	060)	•
		(PASS/FAIL)	+ (21)	
			DARE EVAEA	
PHONON CO		UN	CAGE: 6Y858	0011
7 HERMAN		70	TEL: 203-651-	
SIMSBURY,	LI MPR	70	FAX: 203-651-	.0010

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PHONON CORPORATION
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FILE=3AH8B06A.DAT 15:03:03 05-12-1998

PN\_100832\_825 FINAL\_FUNCTIONAL TEMP:H FLIGHT6\_3FUNCT /N DUAL\_SXX

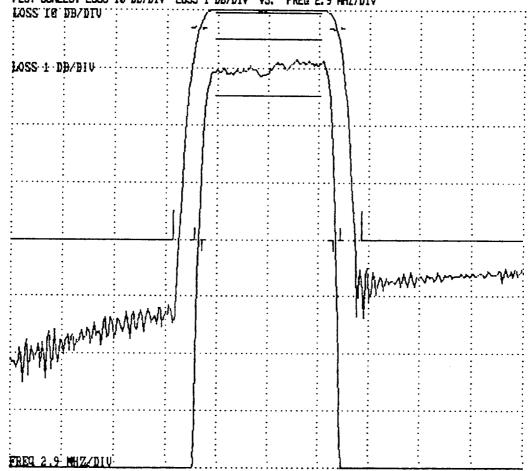
05-12-1998 HP8753, SSCF, SSFFIX, SSREF

FREQUENCY (MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BONDWIDTH= 6

REFERENCES: LOSS(DB) = 29.19427 PHRSE(DE6) = -5345.849 DELAY(US) = 0 SLOPE(US/MHZ) = 0

RMS ERRORS: LOSS(DB)= 8.659902E-02 PHASE(DEG)= 1647.017

PLOT SCALES: LOSS 18 DB/DIV LOSS 1 DB/DIV VS. FRED 2.9 MHZ/DIV



PEAK: LEVEL (DB) = 29.82553	FREQ(MHZ) = 313.8011	DELAY (US) =-2.691813	SIDELOBE (DB) =-45, 20214
EMEDOV. LEHEL (50) - 20, 2020	7 POITED/MITS 210 1	DAD HERTHANITA A AA	MEAN - MICHARITY - 1 E/3/3/E

ENERGY:	LEVEL (DB) =	29.39207 C	ENTER(MHZ)=	312.1943 WI	DTH(MHZ)= 8.	2 <b>00</b> 588 <b>S</b> KEW	(MHZ)=-4.5/	13471E- <b>6</b> 2	
L(DB)	LD (MHZ)	HI (MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX (MHZ)	HIX(MHZ)
<b>-8.</b> 17	313.80109	313.80109	313.80109	<b>6.0000</b> 0	313.80109	<b>8. 99998</b>	9.99	313.80109	313.80109
<b>0.</b> 50	308.67880	315.71797	312. 19794	<b>7.038</b> 27	312 <b>. 2</b> 27 <b>6</b> 8	7.07033	-14.68	388.67888	315.71707
1.88	308.53601	315.82318	312.17960	7.28717	312.22485	7.23696	-15.62	308.53601	315.82318
2.66	<b>388. 36</b> 972	315 <b>.</b> 97757	312. 17365	<b>7.69</b> 785	312. 18784	7.45133	-17.48	308.36972	315.97757
3 <b>.0</b> 0	388.25259	<b>316.0</b> 7651	312. 16455	7.82391	312. 18979	7 <b>.5</b> 6713	-18.99	308.25259	316.07651
4.00	<b>388.</b> 16721	316.15524	312. 16122	7.98804	312.19098	7.65855	-20.77	308.16721	316. 15524
5.80	<b>308.0</b> 9436	316.22638	<b>312. 1603</b> 7	8.13292	312.19183	7.72545	-22.80	308,09436	316, 22638
6.90	<b>308. 03342</b>	316.28970	312. 16156	8,25629	312, 19183	7.72545	-22.77	308. 63342	316, 28970
1 <b>0.6</b> 8	307.82996	316.48294	312.15643	8.65298	312. 19330	7.80187	-27.84	387.82996	316, 48294
20.00	307.51816	316.80078	312. 15948	<b>9.28</b> 262	312.19452	7.83359	-40.19	307.51816	316,80078
30.98	<b>307.326</b> 57	316.98343	312, 15500	9 <b>. 6568</b> 6	312.19400	7.83505	-46.43	307.32657	316.98343
40.00	307, 15808	317, 19846	312, 17828	19, 94937	312, 19493	7, 83524	-AR RE	307 1580A	317 19845

BAND (MHZ)	309.200 315.20	ĺ
LMIN(DB)	<b>-0.</b> 17	
LMAX (DB)	<b>0.</b> 15	
LDEL (DB)	<b>0.3</b> 2	
PMIN(DEG)	-2806, 20	
PMAX (DEG)	2901.34	
PDEL (DEG)	5707.54	

```
PN_100832_825 FINAL_FUNCTIONAL TEMP:H FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753, SSCF, SSFFIX, SSREF
                                                         SYSTEM BANDWIDTH= 6
FREQUENCY (MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1
REFERENCES: LOSS(DB) = 29.15387 PHRSE(DE6) =-15207.19
                                                         DELRY (US) = 9 SLOPE (US/MHZ) = 8
RMS ERRORS: LOSS(DB)= 9.613725E-02 PHASE(DE6)= 1626.906
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED 2.9 MHZ/DIV
LOSS TO DB/DTV
LOSS-1-DB/BIV
PEAK: LEVEL (DB) = 28,96626 FRED (MHZ) = 334.126 DELAY (US) =-2.647151 SIDELDBE (DB) =-43.14718
EMERGY: LEVEL (DB) = 29.3311 CENTER (MHZ) = 332.1887 WIDTH (MHZ) = 8.223755 SKEW (MHZ) = -4.583227E-62
                                              WID (NHZ) AV-CTR (NHZ) AV-WID (NHZ) AV-SL (DB) LOX (NHZ)
                                                                                                          HIX (MHZ)
                                  CTR (MHZ)
L(DB)
          LO(MHZ)
                      HI (MHZ)
                                                                         9.00000
                                                0.00000
                                                           334, 12601
                                                                                      8.00
                                                                                             334.12601
                                                                                                          334, 12601
                                  334.12601
 -8.19
         334.12601
                     334.12601
                                                           332, 22229
                                                                         7.89874
                                                                                    -14.41
                                                                                             328.60614
                                                                                                          335.72177
         328.69614
                     335.72177
                                  332, 16394
                                                7.11563
  0.50
                                                 7.35022
                                                                                              328, 48059
                                  332.15570
                                                           332, 17746
                                                                          7.35081
                                                                                    -16.02
                                                                                                          335, 83081
         328.48059
                     335.83981
  1.00
                                                7.65170
                                                           332.17780
                                                                         7.49518
                                                                                    -17.30
                                                                                             328.34140
         328, 34140
                     335.99310
                                  332.16724
                                                                                                          335.99318
  2.00
                                                                         7.61522
         328.23700
                                  332.16412
                                                 7.85428
                                                           332, 17957
                                                                                    -18.81
                                                                                              328.23700
                                                                                                          336.89128
  3.00
                     336.09128
         328.15827
                                                 8.01953
                                                           332.18097
                                                                         7.70997
                                                                                    -20.57
                                                                                             328.15827
                                                                                                          336.16980
                                  332.16003
                     336.16980
  4.00
                                                           332, 18192
                                                                         7.78829
                                                                                    -22.62
                                                                                             328.08011
                                                                                                          336.24481
         328.08011
                     336, 24481
                                  332.16248
                                                 8.16470
  5.00
                                                 8.28952
                                                           332.19577
                                                                         7.88654
                                                                                    -23.72
                                                                                             328.02237
                                                                                                          336.31189
         328. 62237
                     336.31189
                                  332.16711
  6.00
         327.84586
                                  332.17291
                                                 8.65570
                                                           332.19107
                                                                          7.87824
                                                                                    -29.18
                                                                                             327.84506
                                                                                                          336.50076
 10.00
                     336.59976
         327.55356
                     336.81854
                                  332.18604
                                                9.26498
                                                           332, 18881
                                                                         7.89385
                                                                                    -40.26
                                                                                             327.55356
                                                                                                          336.81854
 20.00
 30.00
         327.31912
                     337.00885
                                  332.16400
                                                9.68973
                                                           332.18866
                                                                         7.89430
                                                                                    -44.99
                                                                                             327.31912
                                                                                                          337.00885
                                                           332.18863
                                                                         7.89444
                     337.20828
                                  332.20804
                                               18.00049
                                                                                    -46.03
                                                                                             327.20779
                                                                                                          337, 20828
         327.20779
BAND (MHZ)
            329,200
                     335, 200
LMIN(DB)
                   -0.18
LMAX (DB)
                   0.17
                   0.35
LDEL (DB)
PMIN(DEG)
                -2771.28
```

PHONON CORPORATION FILE=30H8866A.DAT 15:03:58 05-12-1998

PMAX (DEG)

PDEL (DEG)

2866.59

5637.87

**Channel 14 Bandpass Filter** 

SAW Filter (S/N: 1331576-4, S/N: B07)

			-
		·	
1			

# ELECTRICAL TEST DATA SHEET

TEST: FIN	: HP 875	3D	SERIAL:34		CAL	DUE: <u>1/2</u> DUE:7/7	9/99
	MP 347	BH	SERIAL: 21	36H03121	ин	. DUE: <u>171</u>	/ 70
PARAGR		REG	NUIREMENT T	ITLE		DATA	
REQ.	Q/ATP	OCCOAT	ING TEMPER	ATHE		-5.4	r
3. C. I. I	5.2.1	CONTER	FREQUENCY	HIUNE		<u> </u>	. "
		CENTER	FREDUENCY	CTABILITY			
3.2.1.4			7.535/317.			317.739	MA-17
			6.535/326.			326.726	1817
2215	526		ANDWIDTH:	OGO HEIZ		<u> </u>	. 1916
3.2.1.3	J. E. 4		8/3.0 MHz			2.949	MHz
		U1. 2	8/3.0 MHz			2.955	MHz
7 2 1 5	525	DOSSRO	WD SYMMETR	v			- ' - ' -
3. C. 1. O	J. L. J	LO: /0		11		0. i	dВ
		HI: /0				0.4	
3217	5.2.6	DOSSRO	ND RIPPLE				•
D: C: X: (	0 0	316.57	5-318.825	MHz: /1.6	dВ	<b>0.</b> 5	₫₿
			75-327.825			0.6	
3.2.1.8	5.2.7						_
01 2			7.8/30.2 dB	J		28.3	d₿
			7.8/30.2 dE			28.3	dB
3.2.1.9	5.2.8		TION LOSS V				
<b></b>			8.4/0.4 dB			-0.2	_ dB
		HI: -	0.4/0.4 dB			-0.2	_ dB
3.2.1.10	5.2.9	AMPLI1	TUDE BALANC	Ξ			_
		LO, HI:	: /0.5 dB			<b>8.</b> 1	_ dB
3.2.1.11	5.2.10	OUT-DA	-BAND REJE	CTION			
			Band		PEAK (		IIDTH (MHz)
		WIDE:	1-313, 331-	-1 <b>900 M</b> iz:	46.2		9.900
		DUAL:	313.000-31				
			319.815-3	24 <b>. 5</b> 85,			0.000
			328.815-33		41.2		<u>8.988</u>
		PEAK:	35.0/	18	41.2	dB	8.888 MHz
			: /0.61	Hz		•	0.000 Anz
3.2.1.12	5.2.11					1 24	Unitless
		LO:	/1.30 Uni				_ Unitless _ Unitless
3 6 4 47	F 0 10	HI:	/1.30 Un:			1.63	_ 011141633
3.2.1.14	5.2.12	VSWR	(return los	001 225 575-7	2005	M417	
		316.0	75-318.825,	, 353, 31373	27.023	18.1	ď₿
			S11: 7.5/ S22: 7.5/			18.6	- dB
	5 2 14		ED FUNCTIO			10.0	_ 45
4.8.2	J. E. 14	CIUIL	R FREQUENC'	V0.1/0.	1 MHz	O.	MHz
		2 4B	BANDWIDTH:	-0 06/9.R	6 <b>M</b> Hz	<del>- ਨ</del>	MHz
			TION LOSS:			<del>- 11</del>	_dB
NONE	5 2 15		SHEET SUMM				3
NUIL	J. C. 1.		/FAIL)	1111.6		- V (C	) ( )
		,rn55					<u>-</u> :
	ORPORAT I						CAGE: 6Y858

```
FILE=4AC8B07A. DAT 14:36:31 05-12-1998
PN 188834_826 FINAL_FUNCTIONAL TEMP:C FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753, SSCF, SSFFIX, SSREF
FREQUENCY (MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .85 SYSTEM BANDWIDTH= 2.25
                                                       DELAY (US) = 0 SLOPE (US/NHZ) = 0
REFERENCES: LOSS(DB)= 28.32325 PHASE(DEG)=-34837.23
RMS ERRORS: LDSS(DB) = .1399004 PHASE(DE6) = 743.4576
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED .9 MHZ/DIV
FORE, LO. MB/DLA.
LOSS 1 - DB/BIV -
PEAK: LEVEL (DB) = 27.78894 FREQ (MHZ) = 316.5139 DELAY (US) =-3.117018 SIDELOBE (DB) =-43.63625
ENERGY: LEVEL (DB) = 28.45176 CENTER (NHZ) = 317.7242 WIDTH (NHZ) = 3.07466 SKEW (NHZ) = .0260149
                                             WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ)
                                                                                                        HIX(MIZ)
                                  CTR(MHZ)
 L(DB)
          LD (MHZ)
                       HI (MHZ)
                                                          316.51389
                                                                        9.99999
                                                                                    9.99 316.51389
                                                                                                        316.51389
                                                0.00000
  -8,53
         316,51389
                      316.51389
                                  316.51389
                                                                                  -13.75 316.36353
                                                2.71429
                                                          317.70914
                                                                        2.71757
                                                                                                        319.67782
                      319.07782
                                  317.72067
  9.50
         316.36353
                                                                        2.80199
                                                                                  -15.35
                                                                                           316.33813
                                                                                                        319.12003
                                                2.78189
                                                          317.70947
         316, 33813
                     319.12003
                                  317.72906
   1.00
                                                                                  -17.30
                                                                                           316, 29654
                                                                                                        319.17740
                                                2.88886
                                                          317.71161
                                                                        2.87010
                                  317.73697
                      319.17740
  2.80
         316.29654
                                                                                                        319.21344
                                  317.73895
                                                2.94894
                                                          317.72586
                                                                        2,89781
                                                                                  -18.45
                                                                                           316.26450
          316.26450
                      319.21344
   3.60
                                                                                  -19.68
                                                                                           316.23807
                                                                                                        319.24423
                                                3.00616
                                                          317.71463
                                                                        2.92000
                                  317.74115
          316, 23807
                      319.24423
   4.00
                                                          317.72458
                                                                        2.93986
                                                                                  -21.15
                                                                                           316.21512
                                                                                                        319.27115
                                                3.05603
                    319.27115
                                  317.74313
   5.00
          316.21512
                                                                                           316, 19522
                                                                                                        319.29437
                                                          317.71771
                                                                        2.95237
                                                                                  -22.61
                                  317.74481
                                                3.09915
          316, 19522
                      319.29437
   6.00
                                                                                  -28.70
                                                                                           316, 13248
                                                                                                        319.36554
                                                          317.72394
                                                                        2.97717
                                  317.74982
                                                3.23386
                      319.36554
          316.13248
  10.00
                                                                        2.98449
                                                                                  -48.33
                                                                                           316.03070
                                                                                                        319.47577
                                                3.44587
                                                          317.72409
                                  317.75323
                      319.47577
  28.80
          316.03070
                                                          317.72415
                                                                                                        319.54288
                                                                        2.98492
                                                                                  -47.70
                                                                                           315.96542
                                                3.57745
          315,96542
                      319.54288
                                  317.75415
  30.00
                                                                                                        319.57837
                                                          317.72415
                                                                        2.98498
                                                                                  -51.83
                                                                                           315.93069
                                                3.64767
          315, 93069
                      319.57837
                                  317.75452
  48, 88
 BAND (MHZ)
             316.575
                     318.825
                   -0.33
 LMIN(DB)
 LMAX (DB)
                    0.24
 LDEL (DB)
                    9.57
 PMIN(DEG)
                -1257.81
 PMAX (DEG)
                 1259, 41
                 2517.22
 PDEL (DEG)
```

Passband Symmetry = 0.1 dB

File: 4AC8B07A.DAT

PHONON CORPORATION

### FILE=4CC8B07A.DAT 14:37:25 05-12-1998 PN 100834 826 FINAL\_FUNCTIONAL TEMP:C FLIGHT6\_3FUNCT /N DUAL\_SXX 85-12-1998 HP8753, SSCF, SSFFIX, SSREF FREQUENCY (NHZ): CENTER= 326.7 WIDTH= 9 INCR.= .65 SYSTEM BANDWIDTH= 2.25 DELAY (US) = 0 SLOPE (US/NHZ) = 0 REFERENCES: LDSS(DB) = 28.41616 PHASE(DEG) = -42626.11 RMS ERRORS: LOSS(DB) = .1508651 PHASE(DEG) = 742.3995 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV FORE, LG. DB\DLA. LOSS-1-DB/DIV FREQ .9 MHZ/DIV PEAK: LEVEL (DB) = 27.79443 FREQ (MHZ) = 327.9095 DELAY (US) =-3.173496 SIDELOBE (DB) =-38.92693 ENERGY: LEVEL (DB) = 28.52077 CENTER (NHZ) = 326.7529 WIDTH (NHZ) = 3.07267 SKEW (NHZ) = -4.118835E-82 WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LDX (MHZ) HIX (HHZ) HI (MHZ) CTR(MHZ) L(DB) LO(MHZ) 327.98952 327.90952 9, 66 327.98952 8.99998 327.90952 8,00000 327.90952 327.98952 -0.62 2.77282 -14.46 325.37891 328.10413 326.77692 2.72522 328.10413 326,74152 0.50 325, 37891 -15.29 325.33898 328.13141 2.81434 326.75586 2.79251 325, 33890 328, 13141 326, 73517 1.99 2.88442 -17.29 325, 28555 328, 17224 326.75613 2.88669 326.72888 325, 28555 328, 17224 2.00 2.93555 -19.79325, 24829 328, 20340 326.75580 2.95511 326, 72583 325, 24829 328.20340 3.98 -19.75 2.93555 325.21838 328, 22894 326.75580 3.01056 328.22894 326, 72366 325, 21838 4.00 325.19339 328, 25104 3.05765 2.96841 -22.84 326.75500 328.25104 326,72223 5.00 325.19339 328, 27987 3.09927 326, 75500 2.96841 -22.81 325.17160 326.72125 6, 90 325, 17168 328.27987 328.33386 3.23090 326.75421 2,98665 -26.55 325.10297 328, 33386 326,71841 10.00 325, 10297 2.99897 -39.90 324.99121 328.43369 3.44247 326.75278 328, 43369 326.71246 29,00 324, 99121 328, 49176 2.99942 <del>-46</del>.31 324.91660 326.75284 326.70416 3.57516 324.91660 328, 49176 30,00 -49.18 324.86841 328.67215 326, 75287 2.99948 328, 54584 3.68542 326, 70313 324.86841 40,00 327.825 BAND (MHZ) 325.575 -0.40 LMIN(DB) LMAX (DB) 0.21 LDEL (DB) 0.61 PMIN(DEG) -1261.72 1253, 38 PMAX (DEG)

PHONON CORPORATION

2515.62

Passband Symmetry = 0.4 dB

PDEL (DEG)

File: 4CC8B07A.DAT

# ELECTRICAL TEST DATA SHEET

REROJET P	ART 10	ELECTRICAL TEST DATA SAEET B1576-4 PHONON PART: 100826 SERIA TITLE: <u>Tost Fect</u> DATE: <u>5/12/54</u>	1. <u>B07</u>	
TESTED BY	CINC	TITLE: <u>Tost Feld</u> DATE: 5/12/54	11R: 11.0/Am	
COLL TAIL	1 4 40	53D SERIAL:3410A04374 CAL D		
HUIFHEN			E:7/7/98	
Paragr	APH	REQUIREMENT TITLE	DATA	P/F
ŒQ.	Q/ATP			_
			<u>4.9</u> C	P
_		CENTER FREQUENCY &		
3. 2. 1. 4		CENTER FREQUENCY STABILITY	MI	
			7.749 MHz	<u>р</u> Р
	F 0 4		5.734 MHz	
3.2.1.5	5.2.4	3 dB BANDWIDTH:	0.040 MH.	<u>p</u>
			2.949 MHz	<u> </u>
	- ^ -		2 <u>.956</u> MHz	<u> </u>
3. 2. 1. 6	2.2.2	PASSBAND SYMMETRY	a ()10	n
			<u>0.1</u> dB 0.3 dB	<u>р</u>
	F 0 6		<b>0.</b> 3 dB	<u> </u>
5.2.1.7	2.2.6	PASSBAND RIPPLE	a c	n
			<u>0.6</u> dB 0.5 dB	<u>Р</u>
2010	E 2 7		0.5 dB	
3. 2. 1. 5	3.2.7	INSERTION LOSS	8.5 dB	<u>р</u>
		LO: 27.8/30.2 dB <u>2</u> HI: 27.8/30.2 dB <u>2</u>	8.6 dB	-
2010	E 0 0	INSERTION LOSS VARIATION	0.0 UD	
3. 2. 1. 9	3. 2. 0	TOP TO Y VO Y YE	0.0 dB	p p
			0.0 dB	<del>-</del>
2 0 1 10		AMPLITUDE BALANCE	0.0 00	<u>-</u>
3. 2. 1. 10	3.2.9		0.1 dB	р
2 2 1 11	5 2 10	OUT-OF-BAND REJECTION	6. i np	<u>-</u>
3. C. 1. II	J. 2. 10	BAND PEAK(dB)	WIDTH (MHz)	
		WIDE: 1-313, 331-1000 MHz: 45.8	9. 998	
		DUAL: 313.900-315.585,		
		319.815-324.585,		
		328.815-331.0 MHz: 41.5	e. <del>00</del> 0	
		PEAK: 35.0/ dB 41.5	dB	р
		WIDTH: /0.6 MHz	9.000 Wiz	P
7 2 1 12	5 2 11	SHAPE FACTOR		<u></u>
V. C. 1. IL	W. L. 11	LO: /1.30 Unitless	1.24 Unitless	P
			1.24 Unitless	P
3.2.1.14	5 2.12	VSWR (RETURN LOSS)	*****	<u></u> -
D1 L1 11 1	0.2.12	316. 575-318. 825, 325. 575-327. 825 MHz		
			9.8dB	P
			0.7 dB	P
4.8.2	5, 2, 14	LIMITED FUNCTIONAL TESTS		_
	U.L.	CENTER FREQUENCY: -0.1/0.1 MHz -10	Onl MHz	Ρ
			0,001 MHz	P
		INSERTION LOSS: -0.5/8.5 dB	), I dB-	विक विक
NONE	5, 2, 15	DATA SHEET SUMMARY	0	+
	0	(PASS/FAIL)	Y (DP)	
			<del></del>	
PHONON CO	)RPORAT I	DN	CAGE: 6Y858	
7 Herman			TEL: 203-651	
SIMSBURY,	CT 068	70	FAX: 203-651	-8618

### PN 100834 826 FINAL FUNCTIONAL TEMP: R FLIGHT6 3FUNCT /N DUAL SXX 85-12-1998 HP8753, SSCF, SSFFIX, SSREF FREDUENCY (MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25 PHASE (DEG) =-13974.78 DELAY (US) = 0 SLOPE (US/MHZ) = 0 REFERENCES: LOSS(DB) = 28.53073 RMS ERRORS: LOSS(DB) = .1477551 PHASE(DEG) = 743.5222 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV LOSS 18 DB/DTV LOSS-1-DB/DIV .9 li#HZZDIV PEAK: LEVEL (DB) = 27.99149 FREQ (MHZ) = 316.5255 DELAY (US) =-3.117981 SIDELOBE (DB) =-43.67954 ENERGY: LEVEL (DB) = 28.65812 CENTER (MHZ) = 317.7325 WIDTH (MHZ) = 3.074391 SKEW (MHZ) = 2.849905E-02 WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ) HIX (MHZ) L(DB) LD(MHZ) HI (MHZ) CTR (MHZ) 0.00000 0.00 316.52551 316.52551 316.52551 8.00000 -0.54 316.52551 316.52551 316.52551 2,71781 -13.74316.37161 319.08722 2.71561 317.70813 319.88722 317,72943 0.50 316.37161 316.34555 319, 12982 2.80181 -15.33 2,78427 317.70984 316.34555 319.12982 317.73767 1.00 316, 38688 2.88855 317.72864 2.83888 -16.24 319.18744 317.74716 316, 38688 319.18744 2.00 2.89864 2.94891 317.72870 -18.46316.27438 319, 22330 319, 22330 317.74884 316.27438 3.00 2.93973 -21.20 316, 24882 319, 25540 3.00739 317.72925 319, 25540 317.75171 4.88 316, 24802 316.22546 319.28186 2.93973 -21.173.05640 317.72925 316, 22546 319, 28186 317.75366 5.00 2.95295 -22.62 316.20569 319.38487 317.75528 3.09918 317.73627 316, 20569 319.39487 6.90 -28.63 2.97755 316.14359 319.37637 319.37637 317.75998 3.23279 317.73123 316, 14359 10.00 317.73233 -39.87 2.98495 316.04285 319.48712 319.48712 317.76498 3.44427 316.04285 20.00 2.98547 -58.11315.97943 319.55359 317.73251 319,55359 317, 76651 3.57416 30.00 315.97943 2.98548 -51.13 315.93561 319.59668 317.73251 3.66107 315, 93561 319.59668 317.76614 40,00 BAND (MHZ) 316.575 318.825 LMIN(DB) -0.35LIMAX (DB) 0.2€ LDEL (DB) 0.61 PMIN (DEG) -1257.601259, 66 PMAX (DEG) 2517, 25 PDEL (DEG)

PHONON CORPORATION FILE=4AR8B87A.DAT 14:51:36 85-12-1998

File: 4AR8B07A.DAT

Passband Symmetry = 0.1 dB

### PHONON CORPORATION FILE=ACR8B07A.DAT 14:52:39 05-12-1998 PN 100834 825 FINAL\_FUNCTIONAL TEMP:R FLIGHT6 3FUNCT /N DUAL SXX 05-12-1998 HP8753, SSCF, SSFFIX, SSREF FREQUENCY (MHZ): CENTER= 326.7 WIDTH= 9 INCR. = .05 SYSTEM BANDWIDTH= 2.25 REFERENCES: LOSS (DB) = 28, 62934 DELAY (US) = 0 SLOPE (US/MHZ) = 0 PHRSE (DE6) =-22125, 69 RMS ERRORS: LOSS(DB) = .1420983 PHASE (DEG) = 742.4323 PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FRED .9 MHZ/DIV FORE LOSS, 10, DB/DLA LOSS-1-DB/BIU--FREQ 9 MHZ/DIU PEAK: LEVEL (DB) = 28.02169 FRED (NHZ) = 327.9149 DELAY (US) =-3.180725 SIDELDBE (DB) =-39.7959 ENERGY: LEVEL(DB) = 28.73317 CENTER(NHZ) = 326.7597 WIDTH(NHZ) = 3.073618 SKEW(NHZ) = 3.095556E-02 WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ) HIX (MIZ) L(DB) LB (MHZ) HI (MHZ) CTR (MHZ) 327, 91489 327.91489 0.00000 0.00 327.91489 -8.61 327.91489 327.91489 327.91489 0.00000 325, 38547 328.11397 326.74927 2.72768 326.77631 2.77421 -14.45 325, 38547 328, 11387 0.50 1.00 325, 34451 325.34451 328.14826 326.74237 2.79575 326.75577 2.81469 -15.26 328, 14826 2.88773 326, 75757 2.88518 -17.26325, 29358 328, 18139 2.00 325, 29358 328, 18130 326.73743 3.00 325, 25641 328, 21228 326.73434 2.95587 326, 77127 2,91283 -18.40 325, 25641 328, 21228 4.00 325, 22698 328.23778 326.73230 3.01080 326.75888 2, 93675 -19.73 325, 22690 328, 23770 326.76773 2.95432 -21.68 325, 20190 328, 25980 5.00 325.20190 328, 25980 326.73983 3.05789 2.96983 -22.81 325, 18821 6.00 325, 18821 328, 27966 326.72992 **3. 09**946 326.75955 328, 27966 -26.56 10.00 325, 11157 328, 34256 326.72705 3.23099 326, 75983 2.98816 **325.** 11157 328, 34256 3, 44278 326.75949 3,00037 -39.41 324.99979 328, 44257 20.00 324.99979 328. 44257 326.72119 324.92542 328.50073 38.00 324.92542 328.50073 326.71397 3.57532 326.75967 3.00093 -48.37 3.00095 324.86914 326.79959 3,66275 326.75967 -49.46 324.86914 328, 67825 40.00 328.53189 BAND (MHZ) 325.575 327,825 LMIN(DB) -0.34 LMAX (DB) 0.21 LDEL (DB) 0.55 PMIN(DEG) -1261.26 1253,88 PMAX (DEG)

PDEL (DEG)

File: 4CR8B07A.DAT

2515.13

Passband Symmetry = 0.3 dB

### PHONON CORPORATION FILE=4ER8807A.DAT 14:53:36 05-12-1998 PN 188834 826 FINAL\_FUNCTIONAL TEMP:R FLIGHT6\_3FUNCT /N WIDE\_S21 85-12-1998 HP8753, SSREF, SSREF WIDTH= 999 INCR. = . 208125 SYSTEM BANDWIDTH= 999 FREQUENCY (NHZ): CENTER= 500.5 PHASE (DEG) = 7150.532 DELAY (US) = 4.726672 SLOPE (US/NHZ) = 0 REFERENCES: LOSS(DB) = 28.58003 PHRSE (DEG) = 9968.86 RMS ERRORS: LOSS(DB) = 7.736833 PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 NHZ/DIV LOSS TO DB/DTV PEAK: LEVEL (DB) = 27.7775 FREQ (MHZ) = 316.5941 DELAY (US) = 6.322772 SIDELOBE (DB) =-42.94913 ENERGY: LEVEL (DB) = 28.70038 CENTER (NHZ) = 322.3362 WIDTH (NHZ) = 6.158492 SKEW (NHZ) = 333.9534 WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ) L(DB) LO (MHZ) HI (MHZ) CTR(MHZ) 9, 99999 316.59412 8.88888 0.90 316, 59412 -0.80 316.59412 316.59412 316.59412 2,76235 -24.90 316.59412 2.73740 317.74506 0.50 316.36227 319.09967 317.73096 2,76235 -24, 98 316, 59412 316, 33847 2.89472 317.74506 1.88 319, 14319 317.74084 -25.08 316.30469 2,88889 317.67761 2.89850 2,00 316.38469 319.19357 317.74915 -25, 23 316, 27338 3.00564 3.00 316.27338 319, 22656 317.74997 2.95319 317.73270

HIX (MHZ) 316, 59412 328, 11877 328, 14368 328, 17819 328, 26721 -25.23 316.24292 3.01614 317.73270 3,00564 328, 23364 4.00 316.24292 319.25986 317.75098 3.00564 -25, 23 316, 21674 328, 25717 3.07568 317.73270 5.00 316.21674 319.29242 317.75458 317.73270 3.00564 -25.23 316.19504 328, 27882 3.12549 6.00 316.19504 319.32053 317.75778 -25.23 316.13568 328, 34235 3.00564 3.25372 317.73270 10.00 316, 13568 319.38948 317.76254 -25.26 316.06494 328.43112 3.39703 3.62283 317.76346 317.73215 20.00 316.96494 319.46198 316.00900 3, 82283 -25.26 328, 50574 3,58595 317.73215 30.00 316.90900 319.51495 317.76196 -25, 26 315.95386 328.58035 317.73215 3.02283 315.95386 319.56796 317.76050 3.61490 40.00 1,000 313,000 331,000 1000,000 BAND (MHZ) 45.77 LMIN(DB) 46.67 **-0.**61 LMAX (DB) 97.82 73.56 66.73 74.17 20,96 LDEL (DB) 51, 15 PMIN(DEG) -9999,00 610.01 -9999.00 PMAX (DEG) 3885.80 4399.46 4225.90 PDEL (DEG) 13884.80 3789.45 14224.90 FILE: 4ER8B07A.DAT Out-of-band Rejection: PEAK= 45.8 dB WIDTH= 8.000 MHz

### FILE=4FR8B07A.DAT 14:54:01 05-12-1998 PN 100834 826 FINAL\_FUNCTIONAL TEMP:R FLIGHT6\_3FUNCT /N DUAL\_SXX 85-12-1998 HP8753, SSREF, SSREF FREDUENCY (MHZ): CENTER= 322.2 WIDTH= 30 INCR.=.05 SYSTEM BANDWIDTH= 30 PHASE (DEG) =-18374.3 DELAY (US) = 2.346957 SLOPE (US/MHZ) = 0 REFERENCES: LOSS(DB) = 28.58003 RMS ERRORS: LOSS(DB) = 24.29301 PHASE (DE6) = 1053.715 PLOT SCALES: LOSS 10 DB/DIV VS. FREE 3 MHZ/DIV LOSS TO DB/DTV FREQ 3 MAZ/DIV PEAK: LEVEL(DB) = 27.99147 FREQ(MHZ) = 316.5255 DELAY(US) = 1.575934 SIDELOBE(DB) =-39.82612 ENERGY: LEVEL (DB) = 28.69518 CENTER (NHZ) = 322.2066 WIDTH (NHZ) = 6.147625 SKEW (NHZ) = 7.672201E-82 WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB) LOX (MHZ) L(DB) LO(MHZ) HI (MHZ) CTR(MHZ) HIX(MHZ) 316.52548 9.00000 8.00 316.52548 316, 52548 -0.59 316.52548 316, 52548 316, 52548 0.00000 2.72348 0.58 316.36847 319.09195 317.73822 317.79813 2.74883 -9.26 316.36847 328.11002 317.73853 1.00 316.34363 319.13345 2.78983 317.70984 2.83380 -9.37 316.34363 328, 13785 2.88467 317.72864 2.87129 -9.40 316.38499 2.00 316.30499 319.18967 317.74731 328, 17953 3.88 316, 27295 319.22491 317.74893 2.95197 317.72867 2.93173 -9.48 316.27295 328.21091 4.00 316.24683 319, 25677 317.75180 3.00995 317.72925 2.97329 -9.53 316.24683 328, 23654 317.72925 2.97329 -9.52 5.00 316.22443 319.28395 317.75372 3.05862 316.22443 328. 25876 -9.53 6.00 316.20474 319.30594 317.75534 3.10120 317.73627 2.98666 316.20474 328.27875 -9.55 10.00 316, 14291 319.37711 317.76001 3, 23419 317.73123 3.01154 316.14291 328.34189 316.04245 3.44507 317.73233 3.01902 -9.53 316.04245 28, 99 319.48752 317.76498 328.44220 -9.50 30.90 315.97916 319.55388 317.76648 3.57465 317.73248 3.01955 315.97916 328.50058 -9,49 315.93542 319.59686 317.76614 3.66144 317.73248 315.93542 328.67654 48.00 3.01956 BAND (MHZ) 316.575 318.825 325.575 327.825 LMIN(DB) -0.48 -0.21 -8.29 LINAX (DB) 8.21 76.46 0.26 LDEL (DB) 9.61 76.67 0.55 PMIN (DEG) 269.24 -324.87 -281.18 PMAX (DEG) 927.70 535,77 375.16 PDEL (DEG) 658.46 **860.** 64 656.34

FILE: 4FRBB87A.DAT Out-of-band Rejection: PEAK= 41.5 dB WIDTH= 0.000 MHz

PHONON CORPORATION

PHUNUN CURPURATION

FILE: 4FR8807A.DAT (+SSCF)

PN\_100834\_826 FINAL\_FUNCTIONAL TEMP:R FLIGHT6\_3FUNCT /N DUAL\_SXX

05-12-1998 HP8753, SSREF, SSREF, SSCF

REFERENCES: LOSS(DB) = 28.58003 PHASE(DE6) = -18374.3

DELAY(US) = 2.346957 SLOPE(US/MHZ) = 0

# BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY (MHZ)	LOSS (DB)	PHASE (DEG)
315.000	59.46	1584.89
315 <b>.</b> 72 <b>0</b>	62.98	1295.10
316. <del>440</del>	<b>-0.2</b> 3	971.31
317.160	<b>-0.</b> 13	759.61
317.880	<b>0.</b> 12	543.58
318.600	<b>-0.0</b> 9	327.38
319.320	6.67	123.92
320.040	44.17	154.74
320.760	69.24	-177.90
321.480	<b>56.</b> 46	<b>-295.</b> 67
322 <b>. 200</b>	48.67	-79.31
<b>322.920</b>	52.61	-59. 78
323.640	53.24	76.77
324.360	<b>55.</b> 19	72.18
325.080	12 <b>.38</b>	511.92
325.800	<b>0.0</b> 9	317.25
326.520	<b>6.</b> 18	104.38
327.240	<b>-0.0</b> 2	-111.08
327 <b>.9</b> 60	<b>-0.5</b> 2	-328.98
328.680	<b>40.0</b> 3	<del>-6</del> 87 <b>.5</b> 5
329.400	58.90	-1004.62

FILE=4AH8B07A.DAT 15:06:40 05-12-1998

PN\_100834\_826 FINAL\_FUNCTIONAL TEMP:H FLIGHT6\_3FUNCT /N DUAL\_SXX

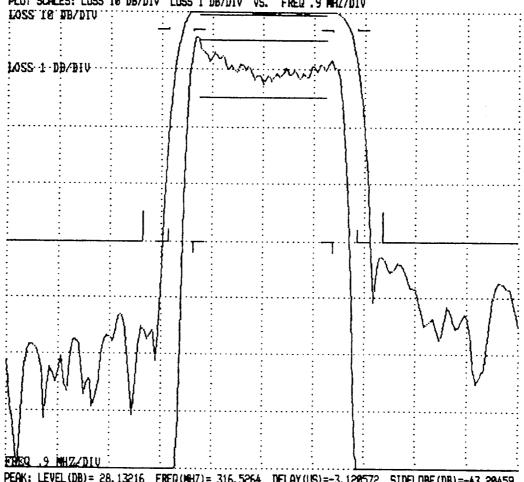
95-12-1998 HP8753, SSCF, SSFFIX, SSREF

FREQUENCY (NHZ): CENTER= 317.7 WIDTH= 9 INCR.= .85 SYSTEM BANDWIDTH= 2.25

REFERENCES: LOSS (DB) = 28.698 PHASE (DEG) = 6275.75 DELAY (US) = 0 SLOPE (US/MHZ) = 0

RMS ERRORS: LOSS(DB)= .1496918 PHASE(DEG)= 743.5699

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



Peak	: LEVEL (DB) = 28	3.13216 FREQ	(MHZ) = 316.52	64 DELAY(US	5)=-3.12 <b>0</b> 572	SIDEL DBE (	OB) =-43, 204	59	
ENER	GY: LEVEL (DB) =		TER(MHZ)= 317						
L(D		HI (MHZ)	CTR (MHZ)		-CTR(MHZ) AV		AV-SL (DB)	LOX (MHZ)	HIX(MHZ)
-0.		316.52637	316.52637	<b>8.9000</b> 8	316.52637	<b>8.0000</b> 0	0.00	316.52637	316, 52637
0.5		319 <b>. 0</b> 8740	317.72919	2.71643	317.70734	2.71878	-13.74	316.37097	319.08740
1.6		319.12967	317.73764	2.784 <b>9</b> 6	317.70908	2 <b>. 88</b> 282	-15.33	316.34561	319.12967
2.6		319.18762	317.74734	2 <b>. 8805</b> 5	317.72787	2.83983	-16.24	316.38707	319.18762
3.6		319.22354	317.74915	2 <b>. 948</b> 82	317.72797	2.89961	-18.47	316.27472	319.22354
4.6		319.25568	317.75208	<b>3. <del>80</del>717</b>	317.72861	2 <b>. 940</b> 64	-21.21	316.24850	319, 25568
5.6		319.28201	317 <b>.7548</b> 6	3 <b>. 95</b> 591	317.72861	2.94 <b>0</b> 64	-21.18	316.22610	319, 28201
6.6		319.30499	317. <i>7</i> 5568	<b>3. 098</b> 63	317.73563	2, 95388	-22.63	316.20636	319.38499
18.6		319.37659	317.76038	3.23242	317.73068	2.97833	-28.61	316.14417	319.37659
20.8		319.48752	317.76495	3 <b>. 44</b> 51 <b>0</b>	317.73181	2.98574	-39.72	316.04242	319.48752
70.0	M 715 87754	710 EE300	317 7/272	3 53615	7/7 77/00				

317.73199

317.73196

2.98628

2.98629

-49.60

-50.87

315.97754

315.92661

319. ~~~99

319.

3.57645

3.67090

317.76575

317.76205

30.00	315.97754	319.55399
40.00	315.92661	319.59750
BAND (MHZ)	316.575	318.825
LMIN(DB)	-0	. 37
LMAX (DB)	0	.25
LDEL (DB)	0	.62
PMIN(DEG)	-1257	. 48
PMAX (DEG)	1260	. 10

2517.50

PDEL (DEG)

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FILE=4CH8B07A. DAT 15:07:34 05-12-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:H FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753, SSCF, SSFFIX, SSREF
                                                           SYSTEM BANDWIDTH= 2.25
FREQUENCY (MHZ): CENTER= 326.7 WIDTH= 9
                                           INCR. = .05
                                                           DELAY (US) = 0 SLOPE (US/MHZ) = 0
                                 PHRSE (DEG) =-1157.034
REFERENCES: LOSS(DB) = 28.78711
RMS ERRORS: LOSS(DB)= .1441652 PHASE(DE6)= 742.4888
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS.
                                                   FRED .9 MHZ/DIV
LOSS TO DE/DTV
LOSS-1-DB/BIV
FREQ .9 MHZ/DIU
PEAK: LEVEL (DB) = 28.19925 FREQ (MHZ) = 327.9158 DELAY (US) =-3.181213 SIDELDBE (DB) =-40.26126
ENERGY: LEVEL (DB) = 28.89385 CENTER (MHZ) = 326.7574 WIDTH (MHZ) = 3.072987 SKEW (MHZ) =-3.803705E-82
                                                WID (MHZ) AV-CTR (MHZ) AV-WID (MHZ) AV-SL (DB)
                                                                                                             HIX(MHZ)
                                                                                               LOX (MHZ)
                                   CTR(MHZ)
 L(DB)
          LO (MHZ)
                       HI (MHZ)
                                                                                                             327.91577
                                                                           8,00000
                                                                                                327.91577
                                                             327.91577
                                                                                        8.99
                                   327.91577
                                                  0.00000
                       327.91577
  -8.59
          327.91577
                                                                                                325.38412
                                                                                                             328, 11905
                                                             326, 77527
                                                                           2.77244
                                                                                      -14.47
                                   326.74707
                                                  2,72592
          325.38412
                       328.11005
  8.58
                                                                                                325, 34451
                                                                                                             328.13770
                                                  2.79318
                                                             326.75467
                                                                            2.81310
                                                                                      -15.29
          325.34451
                       328.13770
                                   326.74109
   1.00
                                                                                                325, 29251
                                                                                                             328, 17899
                                                                           2,88329
                                                                                      -17, 29
          325, 29251
                                                  2.88647
                                                             326, 75616
                       328.17899
                                   326.73575
  2.00
                                                                            2.91047
                                                                                                325, 25543
                                                                                                             328.21011
                                                             326.76965
                                                                                       -18.41
                                   326.73279
                                                  2.95468
          325.25543
                       328,21011
   3.00
                                                                                                325, 22586
                                                                                                             328, 23563
                                                                            2.93456
                                                                                      -19.76
                                                             326.75717
          325, 22586
                       328, 23563
                                   326.73974
                                                  3.00977
   4.00
                                                                                                             328, 25769
                                                                            2.95175
                                                                                                325, 20087
                                                                                       -21.99
                                                             326.76587
          325, 20087
                       328.25769
                                   326,72928
                                                  3.05682
   5.00
                                                                                                325.17911
                                                                                                             328, 27756
                                                                                      -22.84
                                                                            2.96742
                                                  3,09845
                                                             326, 75760
          325.17911
                       328.27756
                                   326.72833
  6.00
                                                                                                             328.34058
                                                                                                325.11044
                                                             326.75769
                                                                            2.98561
                                                                                       -26.59
                                   326.72552
                                                  3.23813
          325, 11044
                       328.34058
  10.00
                                                                                                324.99878
                                                                                                             328, 44174
                                                                            2.99775
                                                                                      -39, 46
                                                             326.75717
          324.99878
                                   326.72828
                                                  3.44296
 20.00
                       328.44174
                                                                                       -48.69
                                                                                                324.92514
                                                                                                             328,58189
                                                                            2.99831
                                                             326.75735
                                    326.71350
                                                  3.57675
          324.92514
                       328.50189
  30.00
                                                                                                324.87088
                                                                                      -49.88
                                                                                                             328.92914
                                                                            2.99833
                                                  3.66571
                                                             326.75732
                                   326.78374
          324.87088
                       328.53659
  40.00
             325.575
                        327.825
 BAND (MHZ)
LMIN(DB)
                    -0. 34
                     0.21
 LMAX (DB)
                     0.55
LDEL (DB)
                 -1260.85
 PMIN (DEG)
                  1254.32
 PMAX (DEG)
```

PDEL (DEG)

ELLA APURRATA NOT

2515.17

Dackband Summatry = 0.7 dB

			<u>-</u> -
ı			

**Channel 15 Bandpass Filter** 

IF Filter (S/N: 1331559-1, S/N: 227-008)

			w.*
			- mark
I			

<b>APPENDIX</b>	<u>(A</u>
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# ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N\_P227-008 AEROJET 1331559-1 REV.

3.0 dB BANDWIDTH
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ACCEPTANCE TEST PROCEDURE	-10°C	+15°C	+40°C
63-0005-02 PARA 4.5.3		_	100

63-0005-02 PARA 4.5.3			
{7} UPPER 3.0 dB BANDEDGE	1 <u>488.83</u> MHz (1480.0-1500.0)	1 <u>487.33</u> Mhz (1480.0-1500.0)	<i>14<u>86.25</u>MHz</i> (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	4 <u>92.36</u> MHz (480.0-500.0)	<u>491.57</u> Mhz (480.0-500.0)	<u> 490.78</u> МН2 (480.0-500.0)
{9} 3.0 dB RELATIVE BANDWIDTH	996.47MHz (980.0-1020.0)	9 <u>95.76 Mhz</u> (980.0-1020.0)	9 <u>95.47</u> MHz (980.0-1020.0)
{10} ADD {7} AND {8} ÷ 2 =	9 <u>90.60</u> MHz (1000.0 NOM)	<u> </u>	<u> </u>
{10a} RECORD MEASURED TEMPERATURE	- <u>13.0</u> °C (-15.0 TO -10.0)	+ <u>17.2</u> °C (12.5 TO 17.5)	<u>+41.6</u> °C (40.0 TO 45.0)
(6) ATTACH TRANSMISSION LOSS	(1)	/(1)	(1)

		/	
(6) ATTACH TRANSMISSION LOSS	<u>√</u> (√)	(\forall )	V (1)
PERFORMANCE X-Y PLOT	<del></del> -		

# **PASSBAND RIPPLE**

ACCEPTANCE TEST PROCEDURE	-10°C	+15°C	+40°C
63-0005-02 PARA 4.5.4			

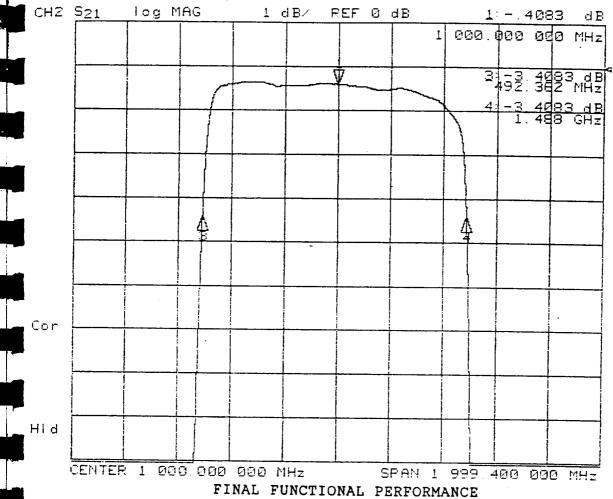
{11a} MIN INSERTION LOSS FREQ 675	5.10MHz 6 <u>75.10</u> Mh	z 695.09 <sub>MHz</sub>
MIN INSERTION LOSS PERFORMANCE -O	0.36_dB - <u>0.37_</u> dB	- <u>0.39</u> dB
{11b} 75% BW LOWER BANDEDGE FREQ 539	9.13MHz 535.58Mh	z 5 <u>33.45</u> MHz
75% BW LOWER BANDEDGE I.L. PERF -	0.56dB - <u>0.62</u> dB	- <u>0,66</u> dB
{11c} 75% BW UPPER BANDEDGE FREQ 1289	9.13 MHz 1285.58Mhz	12 <u>83.45</u> MHz
75% BW UPPER BANDEDGE I.L. PERF - O	.56dB -0.67dB	- <u>(),66</u> dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.20 dB <u>0.25 dB</u>	<u>0.27</u> dB

{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	<u>C.20</u> dB	0.25 dB	0.27 dB
(i.e. @ {11c} - 1.e. @ {11a})			

Prepared in accordance with MIL-STD-100

CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.
	A	57032	63-0005-02	j
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APAJ.DOC	SHEET	13

0.27 dB

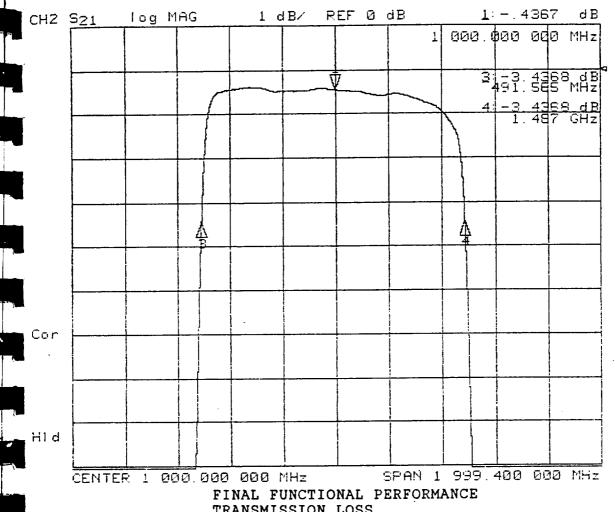


TRANSMISSION LOSS SERIAL NO. P227-008 -10C DATA

MARKER PARAMET

OPR: R. HOGGATT DATE FE3 04 1997 annel 2

MARKER 1	550.000000 MHz OFF	1000.000000 MHz 4083 dB
MARKER 2	1450.000000 MHz OFF	990.596655 MHz OFF
MARKER 3	625.000000 MH⊋ OFF	492.362913 MHz -3.4083 dB
MARKER 4	1375.000000 MHz OFF	1488.830397 MHz -3.4083 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER PLACEMENT MARKER SEARCH TARGET VALUE MARKER WIDTH VALUE	OFF CONTINUOUS OFF -3 dB -3 dB OFF	OFF CONTINUOUS OFF -3 dB -3 dB OFF
MARKER TRACKING	OFF	OFF

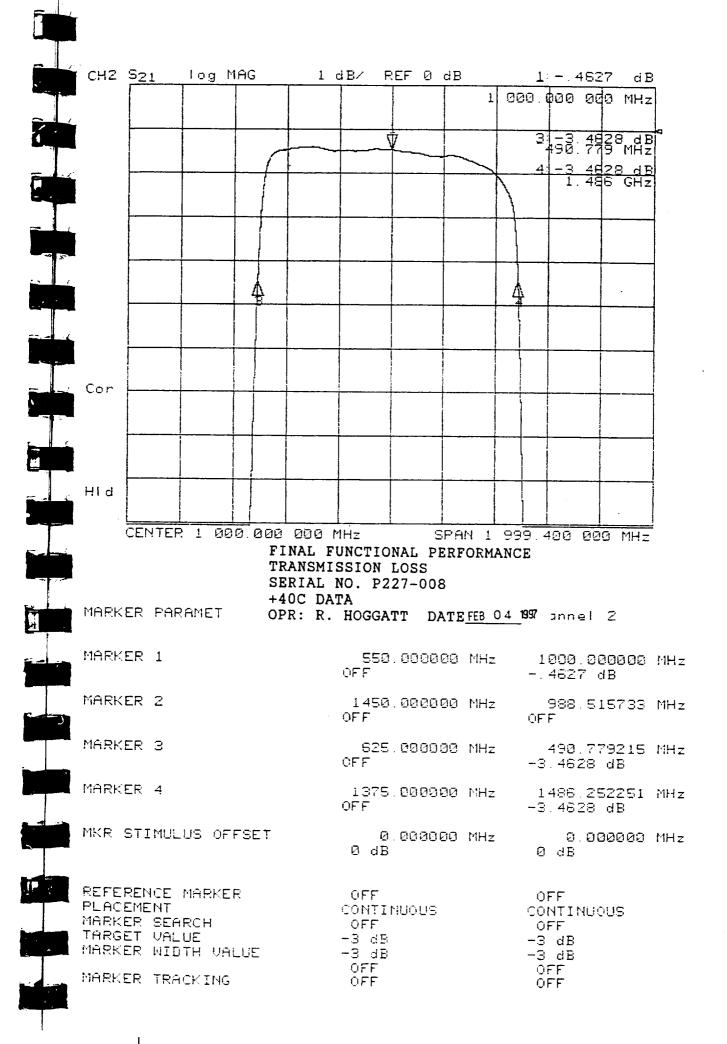


FINAL FUNCTIONAL PERFORMANCE TRANSMISSION LOSS SERIAL NO. P227-008

+15C DATA

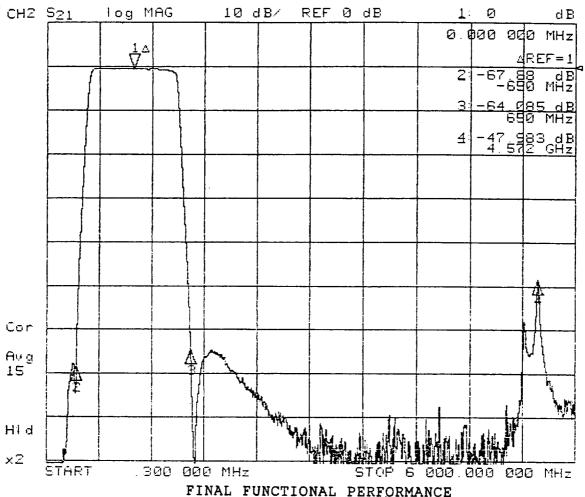
MARKER PARAMET OPR: R. HOGGATT DATE FEB 04 1997 done 1 2

	MARKER 1	550.000000 NHz OFF	1000.000000 MHz 4367 dB
	MARKER 2	1450.000000 MHz OFF	989.445538 MHz OFF
	MARKER 3	525.000000 MHz OFF	491.565545 MHz -3.4368 dB
,	MARKER 4	1375.00 <b>0</b> 000 MHz OFF	1487.325531 MHz +3.4368 dB
	MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
	REFERENCE MARKER PLACEMENT MARKER SEARCH	OFF CONTINUOUS OFF	OFF CONTINUOUS OFF
-	TARGET VALUE MARKER WIDTH VALUE	-3 dB -3 dB OFF	-3 dB -3 dB OFF
عبالمنا	MARKER TRACKING	ÖFF	OFF



# **APPENDIX A ACCEPTANCE TEST REPORT** BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-008 AEROJET 1331559-1 REV. | PASSBAND RIPPLE (CON'T) {11f} RECORD PASS/FAIL (0.5 dB MAX) (11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S) **OUT-OF-BAND REJECTION** ACCEPTANCE TEST PROCEDURE -10°C +15°C +40°C 63-0005-02 PARA 4.5.5 Fc=1000.0 MHz. REF (5A) FOR INSERTION LOSS @ Fc -<u>67.1</u>dB {12} WORST CASE REJECTION FROM (40.0 dB MIN) 0.300 MHz TO 350.0 MHz (40.0 dB MIN) -<u>64.4</u> dB (40.0 dB MIN) <u>64.1 dB</u> -<u>64.2 dB</u> (40.0 dB MIN) (40.0 dB MIN) -64.1 dB {13a} WORST CASE REJECTION FROM 1650.0 MHz TO 3000.0 MHz -<u>48.0</u> dB -48.6 dB (40.0 dB MIN) {13b} WORST CASE REJECTION FROM - 48.2 dB (40.0 dB MIN) (40.0 dB MIN) 3000.0 MHz TO 8000.0 MHz (-15.0 TO -10.0) (12.5 TO 17.5) +41.6°C {13c} RECORD MEASURED TEMPERATURE - 3.0 °C (40.0 TO 45.0) {14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S) TEST PERFORMED BY 12. HOGGATT DATE 2/4/97 NOTE IF TEST WITNESSED BY AESD: \_\_\_\_\_ GSI: Not Witnessed this time. DLD \*\*\*\*\* END OF FUNCTIONAL PERFORMANCE TEST \*\*\*\* **OUTLINE AND MOUNTING DIMENSIONS VERIFICATION** {16} REFERENCE CUSTOMER DRAWING 1331559 **DESCRIPTION OF** DIMENSION AND ACTUAL **MEASUREMENT** TOLERANCE **MEASUREMENT OVER ALL LENGTH** $3.50 \pm .03$ MOUNTING HOLE CENTER $0.125 \pm .010$ BETWEEN UPPER MOUNTING HOLES 3.250 BETWEEN LOWER MOUNTING HOLES 3.250

Prepared in accordance with MIL-STD-100				
CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.
	Α	57032	63-0005-02	J
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APAJ.DOC	SHEET	14

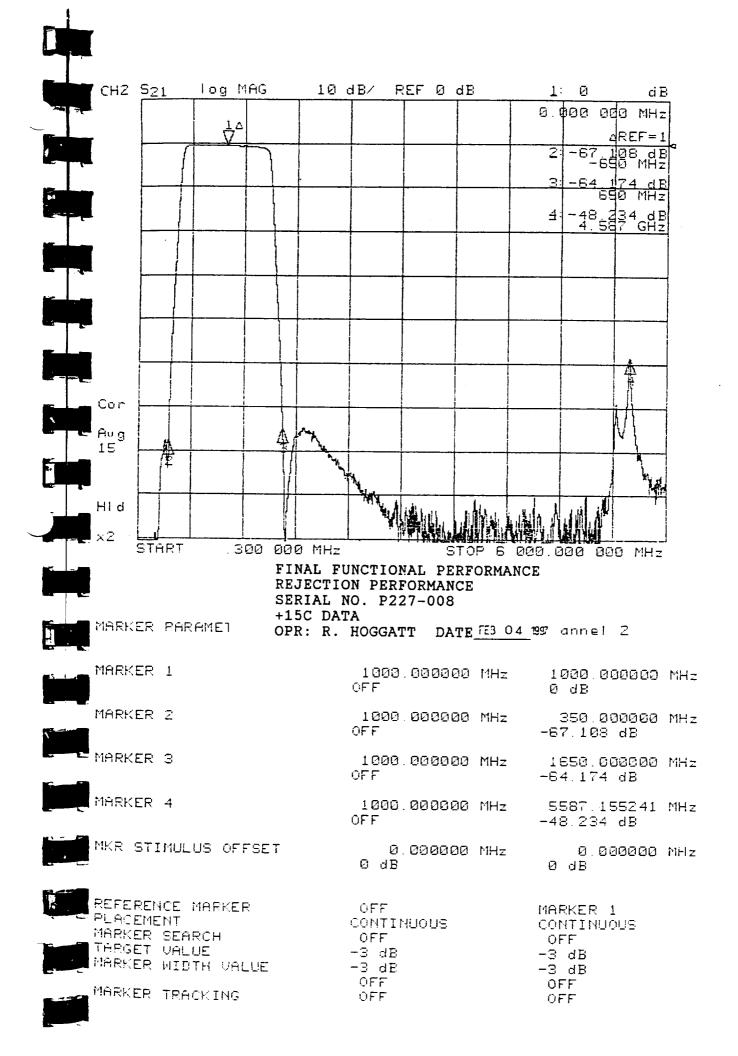


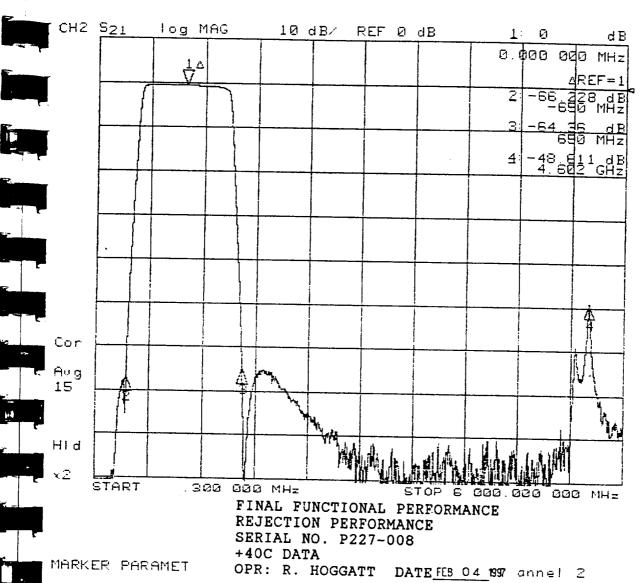
FINAL FUNCTIONAL PERFORMANCE REJECTION PERFORMANCE SERIAL NO. P227-008 -10C DATA

MARKER PARAMET

OPR: R. HOGGATT DATE FEB 04 1997 annel 2

MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -67.88 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -64.085 dB
MARKER 4	1000.000000 MHz OFF	5572.755874 MHz -47.983 dB
MKR STIMULUS OFFSET	0.000000 MH≥ 0 dB	0 dB 0 dB MHz
PLACEMENT MARKER SEARCH TARGET VALUE	OFF CONTINUOUS OFF -3 dB -3 dB OFF OFF	MARKER 1 CONTINUOUS OFF -3 dB -3 dB OFF OFF





· ·		<del></del>
MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000 000000 MHz OFF	350.000000 MHz -66.228 dB
MARKER 3	1000.000000 MHz OFF	1850.000000 MHz -64.36 dB
MARKER 4	1000.000000 MHz OFF	5602.754367 MHz -48.611 dB
MKR STIMULUS OFFSET	ଷ. ପଉପପସତ MHz ପ ଧB	0.000000 MHz 0 dB
OMEKER SEARCH	OFF CONTINUOUS OFF -3 dB -3 dB OFF	MARKER 1 CONTINUOUS OFF -3 dB -3 dB OFF
THURNER TRHCKING	OFF	OFF

OFF

#### APPENDIX A

#### **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227 - 608 AEROJET 1331559-1 REV. E

#### BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6

(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +27.0 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	1.0	MHz	<u>- 88.1</u> dB	F11	1000.0	MHz	-0.50 dB
F2	10.0	MHz	<u>-91.2</u> dB	F12	(*) 1100.0	MHz	-0.56 dB
F3	100.0	MHz	<u>- 88.4</u> dB	F13	(*) 1200.0	MHz	-0.62 dB
F4	300.0	MHz	<u>- 69.1 </u> dB	F14	1300.0	MHz	-0.72 dB
F5	400.0	MHz	<u>-35.3</u> dB	F15	1400.0	MHz	-1.62 dB
F6	500.0	MHz	<u>-2.27</u> dB	F16	1500.0	MHz	-6.48 dB
F7	600.0	MHz	<u>-0.49</u> dB	F17	1600.0	MHz	-42.7 dB
F8	700.0	MHz	<u>-0.44</u> dB	F18	1700.0	MHz	-84.7 dB
F9	(*) 800.0	MHz	<u>-0.52_dB</u>	F19	2000.0	MHz	-66.7 dB
F10	(*) 900.0	MHz	-0.51 dB	F20	5000.0	MHz	-85.7 dB
	•		·	•			

TEST PERFORMED BY: 1 LOGGATT DATE 2 4 97 DA

NOTE IF TEST WITNESSED BY AESD GSI

\*\*\*\*\* END OF BANDPASS CHARACTERISTICS TEST \*\*\*\*\* this time. DLD

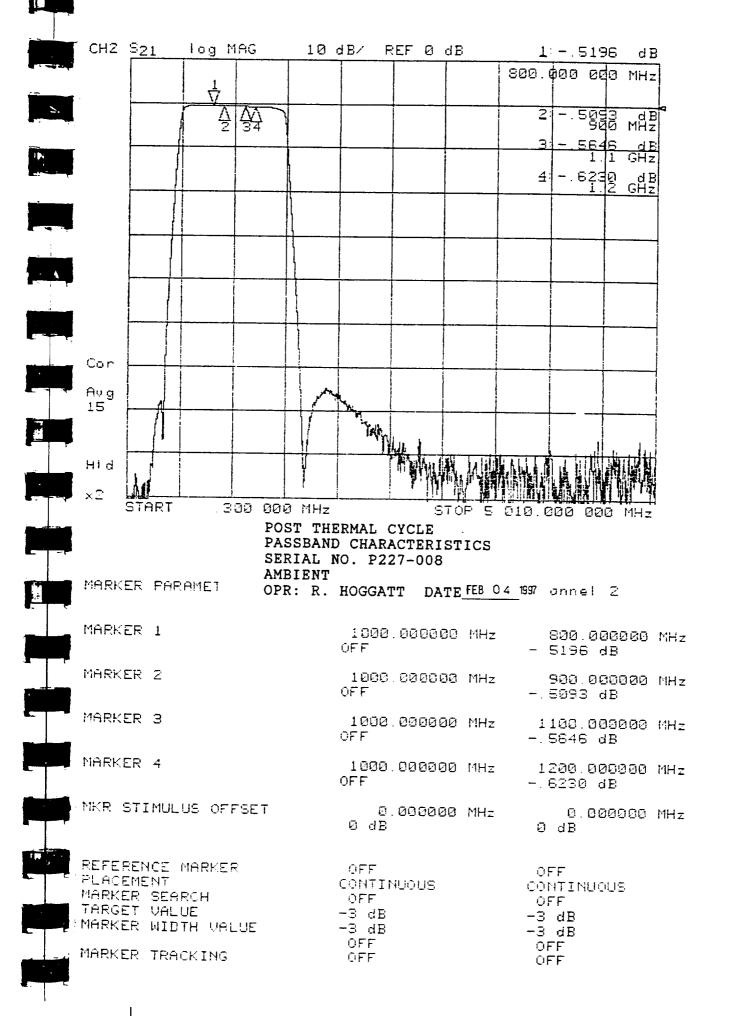
FUNCTIONAL PERFORMANCE TEST

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX A PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

- a.) VSWR PER ATP PARA 4.5.1.
- b.) INSERTION LOSS PER ATP PARA 4.5.2
- c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
- d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
- e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
- f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
- g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.

Prepared in accordance with MIL-STD-100							
CONTRACT NO.	SIZE	CAGE CODE	DWG. NO.	REV.			
	Α	57032	63-0005-02	J			
DADEN-ANTHONY ASSOCIATES INC.	FILE: AC	AD/63/0502APAJ.DOC	SHEET	11			



# GAIN STABILITY AND GAIN COMPRESSION FOR MIXER/AMPLIFIERS AND IF AMPLIFIERS

			_
			May -

Report No. 11413 February, 1999

GAIN-TEMPERATURE SENSITIVITY FOR MIXER/AMPLIFIERS AND IF AMPLIFIERS

15	0.02	-0.017			-0.017
14	90'0	-0.024	+0.003	-0.018	+0.003,
13	90:0	-0.024	+0.003	-0.014	+0.003,
12	90:0	-0.024	+0.003	-0.011	+0.003,
11	90:0	-0.024	+0.003	+0.005,	+0.008, -0.038
10	0.04	-0.024	+0.005		+0.005, -0.024
6	0.04	-0.024	+0.005		+0.005,
8	0.02	-0.017			-0.017
7	0.02	-0.017			-0.0171
9	0.02	-0.017			-0.017
ν,	0.02	-0.015			-0.015
4	0.02	-0.011			-0.011
	0.02	-0.015			-0.015
Channel No.	Specification (+/-dB/°C)	Measured (dB/°C)			Total (dB/°C)

			<b>-</b>

Channel 3 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-13, S/N: 7A33)

			wanter .
ı			

## TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLAT	NESS TEST:	ATP PARAG	RAPH 5.1.3
		7111 1 71101O	AULE AL JOAG

GAIN FLATNESS SPEC. GAIN FLATNESS

(dB)ppK

(dB)ppK

0.17

0,50



REJ

## GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

ECN CAMSU-1352

AMPLIFIER

**GAIN** 

VOLTAGE

9.96

READING (dBm)

 $\Delta G/\Delta V$ 

SPEC.

 $\Delta G/\Delta V$ 

ACC

2.0

DATE ACC REJ

PART NO. <u>1331562-</u> [3 6

SPACEK QA



SER NO.

7A33

TEST FAILURE:

TESTED BY:

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME:

Spacek Labs, Inc. 212 E. Gutierrez St.

## TEST DATA SHEET NO. 7. AMPLIFIER TESTS

## GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature	Relative Gain	ΔG/ΔT	SPEC	ACC REJ
T1 - 6	GT1 71,70			
		* 0.014	0.035dB/°C	QA 1
T2 + g	GT2 71,50			.1
		0.022	0.020dB/°C	NO.
T3 +28	GT3 71,06			i
		* 0.023	0.035dB/°C	QA
T4 +40	GT4 70.79			1 /

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = G_{Ti} - G_{Ti+1}$$

$$\Delta G/\Delta T = G_{Ti} - G_{Ti+1}$$

$$T_i - T_{i+1}$$

$$i = 1,2,3,4$$

$$\Delta G_T = G_{Ti} - G_{Ti}$$

 $\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 1.49$  dB Spec 1.4dB

	( QA )
ACC	REJ 1
<del></del>	

CAMSU-1352

PART NO. <u>1331562-136-</u>

SPACEK QA

DATE ACC RE

TEST FAILURE:

TESTED BY:

FAILURE ANALYSIS NO. \_\_\_\_

END DATE:

Spacek Labs, Inc.

END TIME:

212 E. Gutierrez St.

## TEST DATA SHEET NO. 8. AMPLIFIER TESTS

## OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

D	A	S	H	#

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC REJ
X X X X X X X X X	_ 10	-2.5	0.5	1.0	((4)
X	20				
хх	50	-2.6	0.4	1:0	(8.)
X X X X X X X X	100	-2,6	0.4	1.0	C.
X	150				
X X X X X X	200				1
X	400				
X	500				
X	1000				
X	1500				

## AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

-24.0	-27.8	3.8	1,04
OUTPUT POWER AMBIENT (dBm)	OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
AMPLIFIER	AMPLIFIER		

Above data taken with Daden filter attached (except -19) .

## Intermediate test results for information only

PART NO. <u>1331562-13 G</u>	SPACEK QA 6-29-78 ( SPACEK QA )
SER NO. 7A33	TEST FAILURE:
TESTED BY: 777	FAILURE ANALYSIS NO.
END DATE: 6-5-98	·
END TIME:	Spacek Labs, Inc. 212 E. Gutierrez St.
	Santa Barbara,CA,93101

#### TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

## NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-14-98AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	AGC	REJ
-6	43.3	-22,50	-24.35	1.85	3,3	3,8	ON D	
48	43.4	-22,70	-24.5	1.80	3.4	3.8	ON	<del></del>
+28	43.6	-23,00	-24,80	1.80	3.4	3.8		
+40	43,7	73.20	-25,00	1.80	7.4	3.8	(40)	
Noise figure change // dB Spec is .5dB peak to peak on -20 ACC NOTE: Above data to be taken with the Daden filter, except on the -19 unit.								

## NEAT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 6-23-98 Ambient Room Temperature °C: 25

Attach computer generated  $NE \Delta T$  spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.057

Record Nps(K) Or OS for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

REJ

PART NO. <u>1331562-13</u> 6	SPACEK QA C-29-78 QA
SER NO	TEST FAILURE:
TESTED BY: 77	FAILURE ANALYSIS NO
END DATE: <u>6-24-98</u>	<del></del>
END TIME:	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

## Channel 4 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-14, S/N: 7A44)

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			'- war
			<del>-</del>

## TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATN	VESS TEST: ATP P	ARAGRAPH	<u> 5.1.3</u>	
GAIN FLATN (dB)ppK O.52	TESS SPEC. GAIN (dB)ppK	FLATNESS	ACC RE	j
GAIN VERSU	US VOLTAGE SEN	SITIVITY T	EST: ATP PA	<u>RAGRAPH 5.1.4</u>
AMPLIFIER	GAIN	CUM	SPEC.	ACC DEL
VOLTAGE	READING (dBm)	ΔG/ΔV	ΔG/ΔV	ACC REI
9.96	71.14	213	2.0	
10.00	71.22			
$\frac{0.04}{\Delta Gv} =$	71.31 0.17 dB			
201	u_			DATE ACC REJ
PART N	0. <u>1331562- <b>14</b> 6</u>	_ SPA	ACEK QA	6-8.98 QA
SER NO	. 7A44	_ TES	T FAILURE:	
TESTED	-		RE ANALYSIS	NO
END DA	TE:	5-6-98		
END TI	ME: <u>(600</u>	_	Spacek Labs 212 E. Guti	

## TEST DATA SHEET NO. 7. AMPLIFIER TESTS

## GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal (°C)	Temperature	Relat	ive Gain	ΔG/ΔΤ	SPEC	ACC	REJ
Ť1	-6	GT1	71.94			100	<b>.</b>
				* 0.02(	0.035dB/°C	4	1
T2	+ 8	GT2	71.64				
				. 0,024	0.020dB/°C		/ OA
T3	+28	Gтз	71.16				1
					0.035dB/°C	OA	
T4	+40	GT4	70.80			1	

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}}$$

$$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = \frac{1.77}{dB} \text{ AB Spec 1.4dB} \qquad ACC \underline{\qquad REJ 1}$$

ECN CAMEN 1852

		DATE ACC REJ
		ij QA
PART NO. <u>1331562- 14 6</u>	SPACEK QA	6-8.98

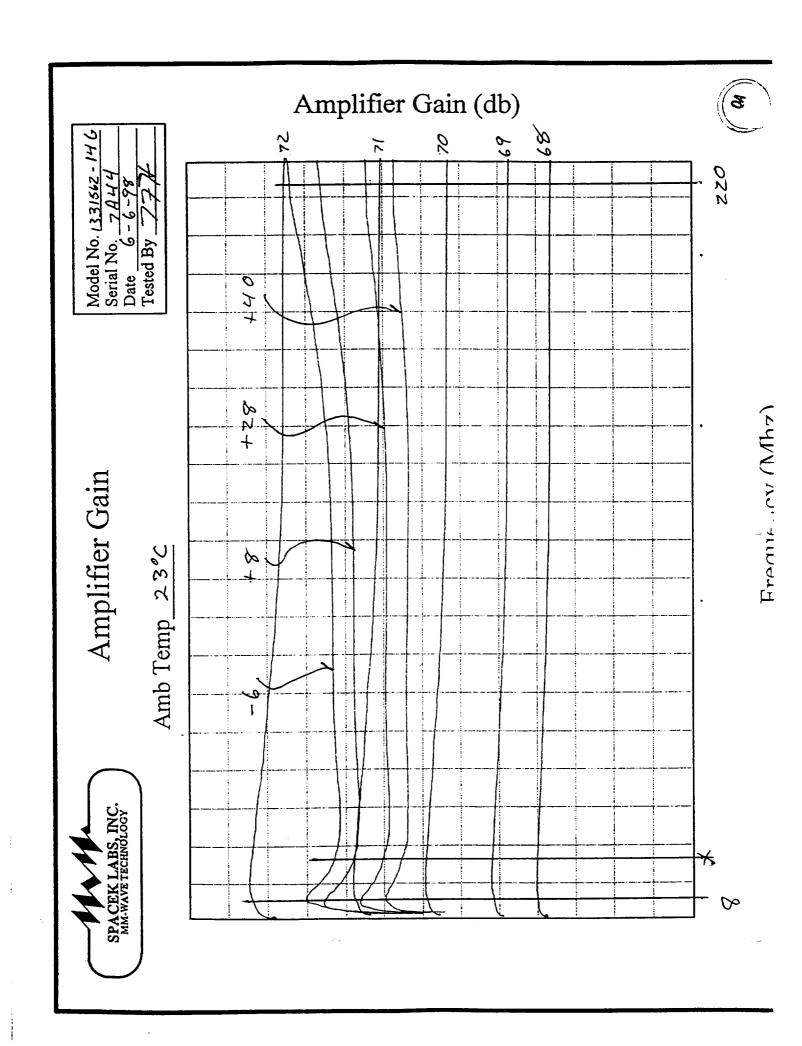
SER NO. 7A44 TEST FAILURE:

TESTED BY: 777 FAILURE ANALYSIS NO. \_\_\_\_\_

:

END DATE: 6-6-98 Spacek Labs, Inc.

END TIME: 1600 212 E. Gutierrez St. Santa Barbara, CA, 93101



## TEST DATA SHEET NO. 8. AMPLIFIER TESTS

## OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH#					
11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	∕ACC\REJ
X X X X X X X X X	_ 10	-2.2	0.8	1.0	(8~)
X	20				
X X	50				
<u> </u>	100	-2.3	0.70	1.0	S-V
X	150				
X X X X X X	200	-2.3	0.7	1.0	8-
X	400				
· X	500				
X	1000		<del></del>		
Х	1500				

## AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

-20.4	- 24.0	3.6	1.19
AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)

Above data taken with Daden filter attached (except -19).

## Intermediate test results for information only

4	
SER NO. <u>7A44</u>	TEST FAILURE:
TESTED BY: 777	FAILURE ANALYSIS NO
END DATE: 6-5-9	<u> </u>
END TIME: 1600	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101
END DATE: 6-5-9	FAILURE ANALYSIS NO.  Spacek Labs, Inc. 212 E. Gutierrez St.

## TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

# NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 8-20-8 AMBIENT ROOM TEMPERATURE °C: +2/

UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC OA	REJ
-6_	43.3	-18.40	-20.08	1.68	3.70	3.8	N. O. O. O. O. O. O. O. O. O. O. O. O. O.	
+8	43.4	-18,50	- 20.15	1.65	<u>3,75</u>	3.8	1	. —
+28	43.6	-18.80	- 20,45	1.65	3.75	3.8	1 (A	/
<u>+40</u>	43.7	-19.10	-20.73	1.63	3.80	3.8	QA 1	<i>:</i>
Noise figure change O, / dB Spec is .5dB peak to peak on -20 ACC NOTE: Above data to be taken with the Daden filter, except on the -19 unit.								

## NEAT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 8/24/98 Ambient Room Temperature °C: 424

Attach computer generated  $NE \triangle T$  spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0,055

Record Nps(K) O.0 % for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC REJ

-	DATE ACC REJ
PART NO. <u>1331562-14</u> 6	SPACEK QA 8-21-98
SER NO	TEST FAILURE:
TESTED BY:	FAILURE ANALYSIS NO.
END DATE: 8-20-98	<del></del>
END TIME: /600	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

Channel 5 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-15, S/N: 7A35)

			_

## TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS T	EST: ATP	PARAGRAP.	H 5.1.3
01111 1 1 12 12 12 12 12 12 12 12 12 12 1		* · · · · · · · · · · · · · · · · · · ·	

GAIN FLATNESS

SPEC. GAIN FLATNESS

(dB)ppK

(dB)ppK

0,37

ACC

**REJ** 

## GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER

**GAIN** 

VOLTAGE

READING (dBm)

 $\Delta G/\Delta V$ 

2.13

SPEC.

ΔG/ΔV

ACC REL

9.96 10.00 10,04

 $\Delta G_V =$ 

dB

ECN

CAMSU-1352

DATE ACC REJ

PART NO. <u>1331562-15</u> F

SPACEK QA

SER NO. 7A35

TEST FAILURE:

TESTED BY:

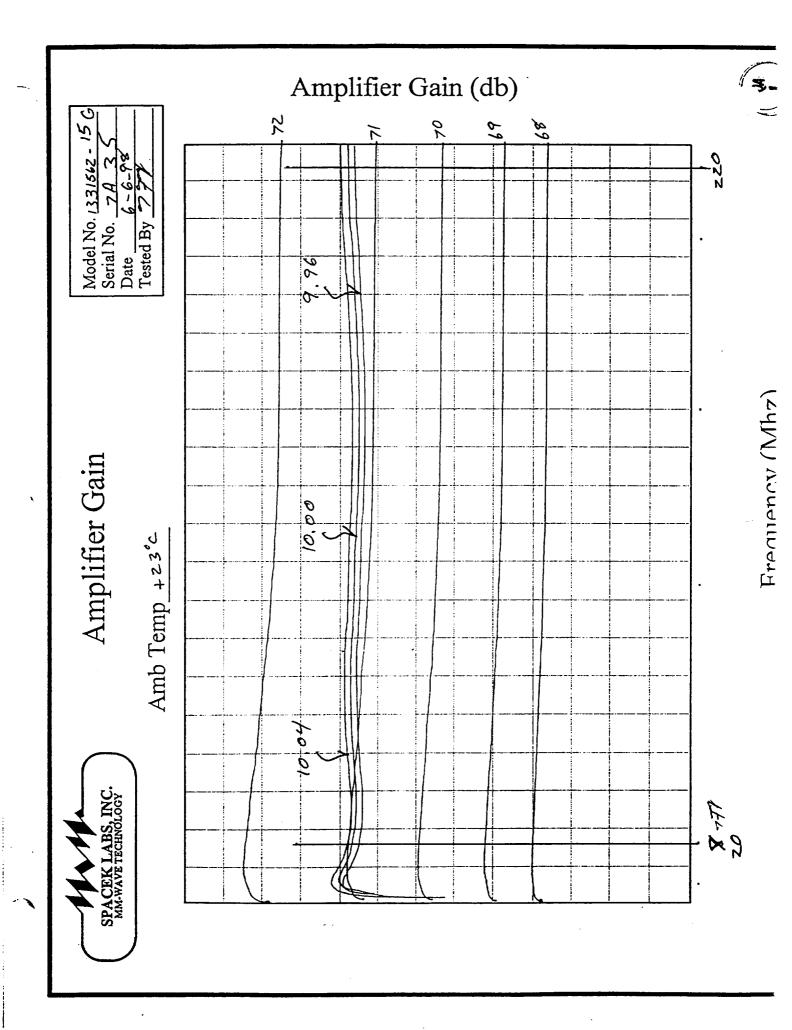
FAILURE ANALYSIS NO. \_\_\_\_\_

END DATE:

Spacek Labs, Inc.

END TIME: 1600

212 E. Gutierrez St.



## TEST DATA SHEET NO. 7. AMPLIFIER TESTS

## GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nomina (°C)	i Temperature	Relat	ive (	Sain	ΔG/ΔT	SPEC	ACC	REJ
T1	-6	GT1	71,	97				
					* 0.017	0.035dB/°C	J/ QA	1
T2	18	GT2	7]	,73			1	
					* 0.022	0.020dB/°C		ΟY
T3	+28	Gтз	7	1,29				1
					* 0.033	0.035dB/°C	QA	
T4	+40	GT4	70	0.89			1	1

ECW CAMSU - 1352

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = G_{Ti+1}$$

$$\Delta G/\Delta T = i = 1,2,3,4$$

$$T_{i} - T_{i+1}$$

$$\Delta G_{T} = -1.08 - dB$$

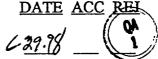
 $\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 1.65 dB$  Spec 1.4dB

	( v
ACC	REJ

CAMSU- 1352

PART NO. <u>1331562-15 F</u>

SPACEK QA



SER NO. 7A35

TEST FAILURE:

TESTED BY: 777

FAILURE ANALYSIS NO.

END DATE:

Spacek Labs, Inc.

212 E. Gutierrez St. Santa Barbara, CA, 93101

END TIME:

## TEST DATA SHEET NO. 8. AMPLIFIER TESTS

## OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

D	٨	C.	Ц	#
-17	м	. 7.	п	#

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC REJ
X X X X X X X X X	10	<del></del>			
X	20	-2,2	0.8	1.0	<b>&amp;</b> −
X X	50	=212 17	7-0.5		
X X X X X X X X X	100	-2,2	0.8	1.0	<u> 동</u> -
X	150	***************************************			
<u> </u>	200	-2,2	0.8	1.0	<b>5-</b> )
X	400	<b></b>	•	<del></del>	
X	500	·			<del></del>
X	1000				
X	1500		<u> </u>	<del></del>	<del></del>

## AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER	AMPLIFIER		
OUTPUT	OUTPUT		AMPLIFIER
POWER	POWER	Y FACTOR	NOISE
AMBIENT (dBm)	(-77 K)(dBm)	(dB)	FIGURE (dB)
<b>.</b>		7 -	1
-20.9	-24.6	3,7	1,11

Above data taken with Daden filter attached (except -19).

## Intermediate test results for information only

PART NO. <u>1331562-15</u> G	SPACEK QA C-21-78 ET
SER NO. 7A 35	TEST FAILURE:
TESTED BY: 777	FAILURE ANALYSIS NO
END DATE: 6-5-98	
END TIME: 77%	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

## TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

# NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: <u>6-24-98</u>AMBIENT ROOM TEMPERATURE °C: +2/

UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC REJ
-6	43.7	-19,10	-21.00	1.90	3,2	3.8	(a) _
+8	43.7	-19.30	-21,20	1,90	3.2	3.8	
+28	43.9	-19.60	-21.50	1.90	3.2	3.8	a _
+40	43.9	-19.80	-21.65	1.85	3.3	3.8	(21)_
			pec is .5dB peak  the Daden filt	-			REJ

## NEAT-NOISE POWER STABILITY TEST; ATP PARAGRAPH 5.4.9

Date: <u>6-22-98</u> Ambient Room Temperature °C: 24

Attach computer generated  $NE \Delta T$  spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.038

Record Nps(K) 0,08 for dash number from Aerojet specification AE-24869, Table II.

Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

END TIME:	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101
END DATE: 6-25-98	
TESTED BY: 7 T	FAILURE ANALYSIS NO
SER NO. <u>7A35</u>	TEST FAILURE:
PART NO. <u>1331562-156</u>	SPACEK QA 6-2998 ( The space of the space of

Channel 6 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-16, S/N: 7A36)

#### TEST DATA SHEET NO. 6. AMPLIFIER TESTS

CATN	FLATNESS	TEST	ATP PARA	<i>AGRAP</i>	H 5	7 3
( T /4 / / Y	J' 1 / 1 1 1 1 1 2 2 1 3 1 3 1 3 1 3 1 3 1 3 1		MII I MUV.	TOTOTA :	44 J.	

GAIN FLATNESS

SPEC. GAIN FLATNESS

(dB)ppK

(dB)ppK

0,50



## GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER

GAIN

VOLTAGE

READING (dBm)

 $\Delta G/\Delta V$ 

2.25

SPEC.

 $\Delta G/\Delta V$ 

2.0

ACC RE

ECN CAMSU- 1352

71.01 71.10 71.19 0,18

DATE ACC REJ

PART NO. 1331562-165

SPACEK QA

SER NO. \_\_\_\_\_\_ 7A36

TEST FAILURE:

TESTED BY:

FAILURE ANALYSIS NO. \_\_\_\_\_

END DATE:

Spacek Labs, Inc.

END TIME:

212 E. Gutierrez St.

Frequency (Mhz.)

#### TEST DATA SHEET NO. 7. AMPLIFIER TESTS

## GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal	Temperature	Relat	ive Gain	ΔG/ΔΤ	SPEC	ACC	REJ
T1	-6	G <sub>T1</sub>	71.78			O <sub>A</sub>	
				* 0.016	0.035dB/°C	Wi.	J .
T2	+8	GT2	71.55				
				0.025	0.020dB/°C		AO
T3	+28	Gтз	71.06				1
				* 0.035	0.035dB/°C	( AO \	``
T4	+40	GT4	70.64			1	'

ECN CAMSU-1352

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad \qquad i = 1,2,3,4 \qquad \qquad \Delta G_T = \frac{1}{2} \frac{$$

 $\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = \frac{1.72}{2} dB$  Spec 1.4dB ACC\_

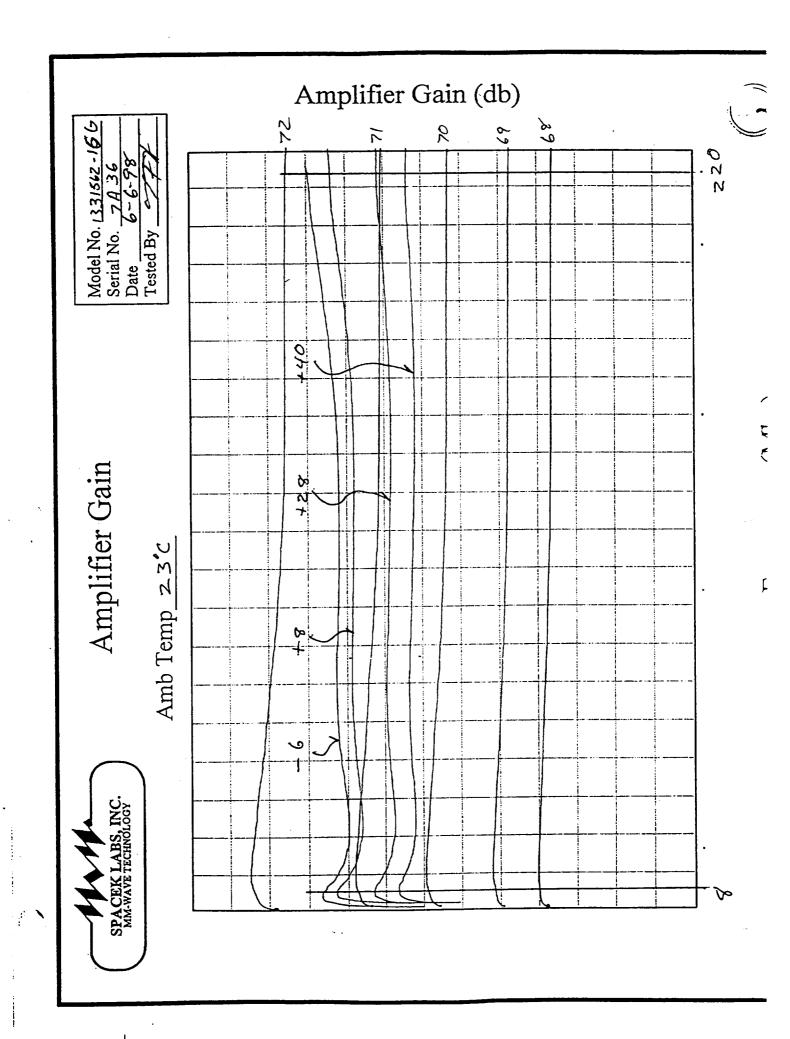
CC\_\_\_\_REJ

ECN CAMSU-1357

DATE ACC REJ

PART NO. <u>133</u>	1562-166	SPACEK QA	6. <u>79-98</u>
SER NO	7A36	TEST FAILURE:	
TESTED BY:	777	FAILURE ANALYSIS	NO
END DATE:	6-5-98	Snacek Lahs	
		Snacek Lans.	inc.

END TIME: 1600 Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara, CA,93101



# TEST DATA SHEET NO. 8. AMPLIFIER TESTS

# OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH#				•	
11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC REJ
X X X X X X X X	10	-2.6	0.4	1.0	
x	20				
ХХ	50				<i>_</i>
X X X X X X X X X	100	-2.7	0.3	1.0	&
X	150				
<u> </u>	200	-2.7	0.3	1.0	&-)
X	400				/
X	500				
· X	1000			<del></del>	
X	1500				

# AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
- 20,5	-24.1	3.6	1,19

Above data taken with Daden filter attached (except -19) .

## Intermediate test results for information only

PART NO. <u>1331562-16<del>65</del></u>	SPACEK QA	DATE ACC REJ
SER NO	TEST FAILURE	B:
TESTED BY: 777	FAILURE ANALY	SIS NO
END DATE: 6-5-98		<del></del>
END TIME: 1600	Spacek Lal 212 E. Gut Santa Bart	

#### TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

# NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-24-98AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC REJ
-6	43.5	-18,70	-20,50	1.80	3,4	3.8	1
+8	43.6	-18.40	-20.70	1.80	3.4	3.8	
+28	43.7	-19.20	-21,00	1.80	3:4	3.8	
+40	43.8	-19.50	-21,20	1.70	3.6	3.8	1
Noise figure change 0.2 dB Spec is .5dB peak to peak on -20 ACC REJ NOTE: Above data to be taken with the Daden filter, except on the -19 unit.							

#### NEAT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 6 · 22 · 98 Ambient Room Temperature °C: 24

Attach computer generated  $NE \triangle T$  spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.05 \$

Record Nps(K) 6.08 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC

REJ

PART NO. <u>1331562-</u> 165	SPACEK QA  C-29-98  QA  DATE ACC REJ
SER NO. 7A36	TEST FAILURE:
TESTED BY:	FAILURE ANALYSIS NO
END DATE: 6-25-98	
END TIME: 1600	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

Channel 7 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-17, S/N: 7A47)

			-
			and the second
1			

## TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATN (dB)ppK	IESS SPEC. GAIN (dB)ppK	FLATNESS	ACC R	EJ
0.43	0.50	)		···
	•			
<u>GAIN VERSU</u>	IS VOLTAGE SEN	SITIVITY TE	ST: ATP P	ARAGRAPH 5.1.4
AMPLIFIER	GAIN		SPEC.	
VOLTAGE		$\Delta G/\Delta V$	$\Delta G/\Delta V$	ACC REJ
9.96	71.14	2.0	2.0	(M) _
10.00	71.22			
$\frac{10.04}{\Delta G v} =$	0.16 dB			
201				DATE ACC REJ
PART N	O. <u>1331562-</u> <b>17 F</b>	_ SPAC	CEK QA	6-8-98 QA
SER NO	7A47	TEST	FAILURE:	
TESTED	BY: <b>777</b>	_ FAILURE	E ANALYSI	S NO
END DA	TE: <u>6-6-98</u>			·
END TIM	1. 44	- -	Spacek Lal 212 E. Gut Santa Bark	

#### TEST DATA SHEET NO. 7. AMPLIFIER TESTS

## GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nomina (°C)	al Temperature	Relat	ive Gain	ΔG/ΔΤ	SPEC	ACC	REJ
T1	-6	GT1	7z.0				.
				. 0.022	0.035dB/°C	// QA	
T2	+8	GT2	71.69			1	
					0.020dB/°C		QA
T3	+ 28	Gтз	71.18				1
				* 0.023	0.035dB/°C		· · · · · ·
T4	+ 40	GT4	70.90			( QA	
			<u> </u>			1	

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}}$$

$$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 2.66 \, dB \quad Spec 1.4 dB \quad ACC$$
REJ

DATE ACC REJ ENGINEERING DATA

ONLY. SEE AE 24869

FARA. 3.2.1.15.1

PART NO. <u>1331562-175</u> SPACEK QA

SER NO. 7A47 TEST FAILURE:

TAN LIDE ANIAL VEIC NO

TESTED BY: 777 FAILURE ANALYSIS NO. \_\_\_\_\_

END DATE: 6-6-98 Spacek Labs, Inc.

END TIME: /600 212 E. Gutierrez St.
Santa Barbara, CA,93101

#### TEST DATA SHEET NO. 8. AMPLIFIER TESTS

#### OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

D	A	SH	1 ##
1.	_		ιπ

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC REJ
X X X X X X X X X	10	-2.6	0.4	1.0	( <u>a</u> -
X	20		<del></del>		
X X	50			<del> </del>	
X X X X X X X X X	100	-2.7	0.3	10	<u>8-</u>
X	150				
X X X X X X	200	-2.6	0.4	1.0	<u> </u>
X	400				
X	500		•		
. X	1000	<u></u>			
X	1500		•		

## AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

- 20.Z	- 23.8	3.6	1.19
POWER AMBIENT (dBm)	POWER (-77 K)(dBm)	Y FACTOR (dB)	NOISE FIGURE (dB)
OUTPUT	OUTPUT		AMPLIFIER
AMPLIFIER	AMPLIFIER		

Above data taken with Daden filter attached (except -19).

#### Intermediate test results for information only

PART NO. <u>1331562-</u> 17 F	SPACEK QA $\frac{DATE}{8-78}$ $\frac{ACC}{Q^A}$
SER NO. <u>7A47</u>	TEST FAILURE:
TESTED BY: 777	FAILURE ANALYSIS NO
END DATE: 6-5-98	
END TIME: 1600	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

## TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

## NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 8-20-98AMBIENT ROOM TEMPERATURE °C: +2/
---

DATE:	7-20-98AM	BIENT ROOM	TEMPERATI	URE °C: <u>†2</u>				
UUT TEMP °C.	UUT. CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR, (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.6	-19.00	-21,10	2.1	2.9	3.8	AQ T	` ;/—-
+8	43.6	-19.20	-21.30	2.1	2,9	_3.8	1	/
+28	43.7	-19.60	-21.70	2.1	2.9	3.8	AP	
+40	43.8	-19.80	-21,90	2,1	2,9	3.8	(QA)	/
		dB Spo o be taken with	_	-		CC QA	REJ	
ΝΕΔΤ-Ν	OISE POWE	ER STABILITY	TEST: ATP I	PARAGRAPH	<u>5.4.9</u>			
Date: 8-	<u> 25-98</u> Amb	ient Room Ten	perature °C:	25				
Attach co	omputer gene	erated <i>NE</i> \( T \) sp	readsheet to th	is test data she	et.			
Record t	he calculated	Nps(K) from s	spreadsheet dat	a: 0.049				

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

-	REJ
PART NO. <u>1331562-17 </u> 6	SPACEK QA  8-21-98  QA  1
SER NO	TEST FAILURE:
TESTED BY: De	FAILURE ANALYSIS NO.
END DATE: 8-20-98	
END TIME: 1600	Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

# Channel 8 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-18, S/N: 7A28)

			**

#### TEST DATA SHEET NO. 6. AMPLIFIER TESTS

## GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

**GAIN FLATNESS** 

SPEC. GAIN FLATNESS

(dB)ppK

(dB)ppK

0.50

0.50

ACG REJ

#### GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

1.75

AMPLIFIER

GAIN

VOLTAGE READING (dBm)

m) ΔG/ΔV

SPEC.

ΔG/ΔV

2.0

A CO

**REJ** 

DATE ACC REJ

PART NO. 1331562-186

SPACEK QA

6-29-98 QA

SER NO.

7A28

TEST FAILURE:

TESTED BY:

771

FAILURE ANALYSIS NO.

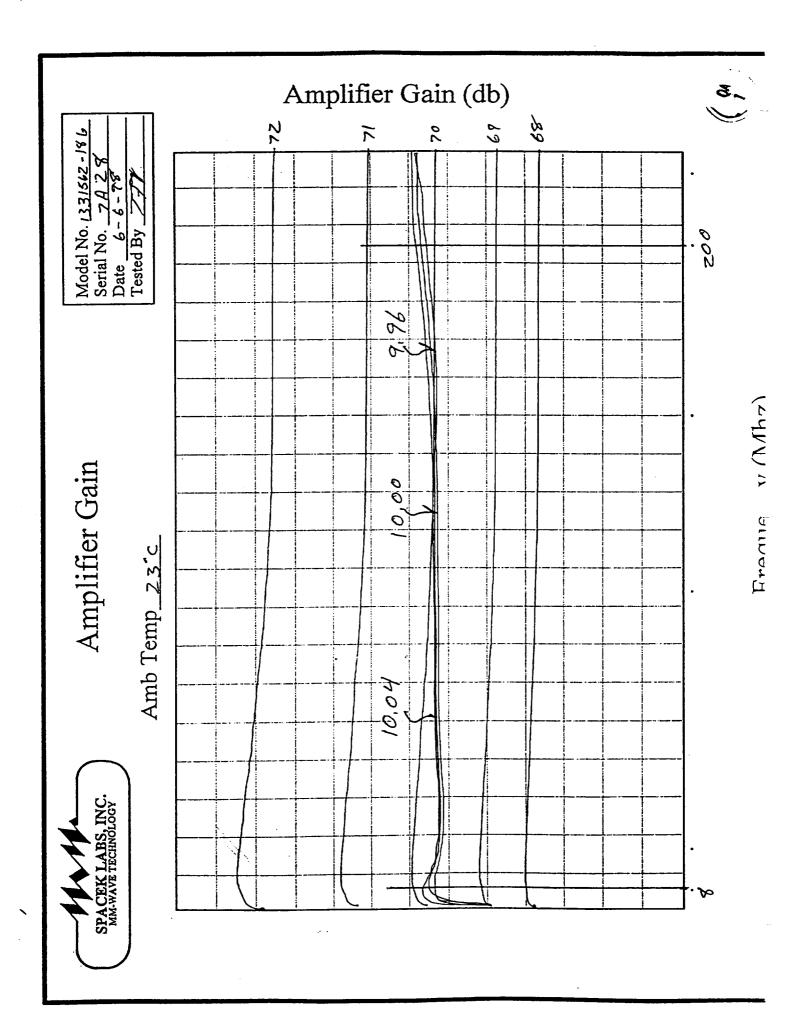
END DATE: 6 - 5 - 98

END TIME:

1600

Spacek Labs, Inc. 212 E. Gutierrez St.

Santa Barbara, CA, 93101



#### TEST DATA SHEET NO. 7. AMPLIFIER TESTS

### GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nomina (°C)	l Temperature	Relat	ive Gain	ΔG/ΔΤ	SPEC	ACC	REJ
T1	-6	GT1	70.95				
				* 0.018	0.035dB/°C	Q4	
T2	+8	GT2	70.70			1	
				. 0-027	0.020dB/°C		Q4
Т3	+28	Gтз	70.17				1
	,			* 0.027	0.035dB/°C	, na	N
T4	+ 40	GT4	69.85			i	•

ECN CAMSU-135

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = G_{Ti} - G_{Ti+1}$$

$$\Delta G/\Delta T = ---- i = 1,2,3,4$$

$$T_{i} - T_{i+1}$$

$$\Delta G_T = \frac{//}{dB}$$

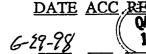
 $\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = \frac{1.64}{1.64} dB$  Spec 1.4dB

	1
ACC	REJ_

ecn Camsu-135

PART NO. 1331562-186

SPACEK QA



SER NO. 7A18

TEST FAILURE:

TESTED BY: 77

\_\_ ILUI I I IIIUU IL

TESTED BY: \_///\_\_

FAILURE ANALYSIS NO. \_\_\_\_\_

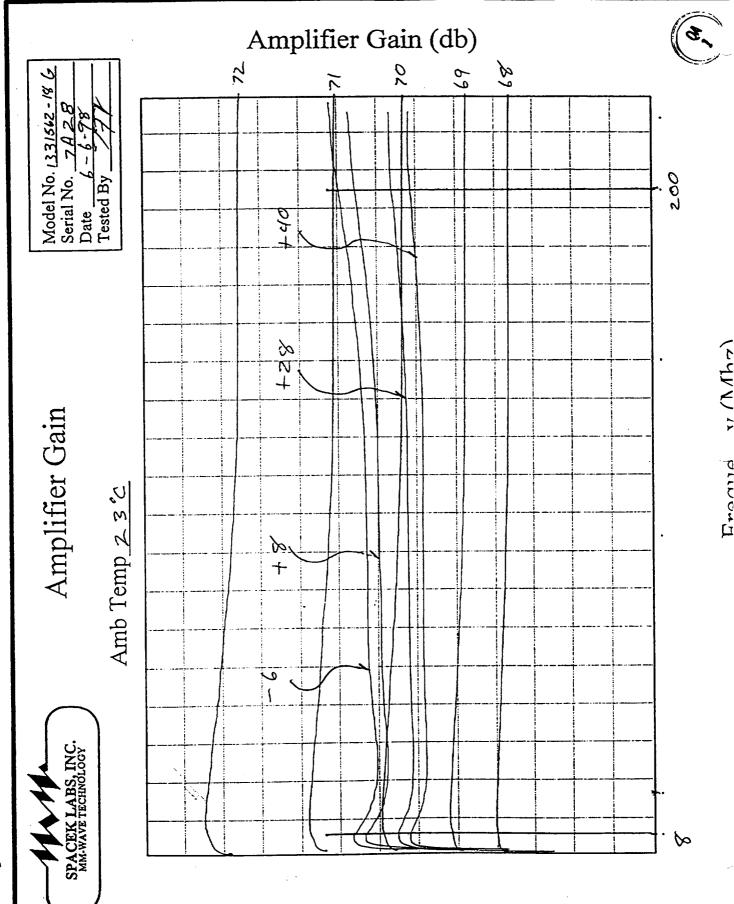
END DATE: 6-5-98

Spacek Labs, Inc. 212 E. Gutierrez St.

END TIME: 1600

Santa Barbara, CA, 93101

\_\_\_\_



#### TEST DATA SHEET NO. 8. AMPLIFIER TESTS

#### OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

$\mathbf{r}$		OTT	11
1)	А	NН	#

·					
		P2	OUTPUT	SPEC.	
11 12 13 14 15 16 17 18 19 20	FREQ.	COMP	COMP.	COMP.	
	(MHz)	(dBm)	at+10(dBm)	PT.(dBm)	ACC REJ
X X X X X X X X	_ 10	-2.3	0.7	1,0	(3~)
X	20				
хх	50				
X X X X X X X X	_ 100	-2,4	0.6	1.0	8
X	150				
X X X X X X	200	-Z.4	0.6	1.0	9
X	400				
X	500		·	-	
X	1000				
X	1500				

#### AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 5-6-98 AMBIENT ROOM TEMPERATURE °C: 23

AMPLIFIER
OUTPUT
OUTPUT
OUTPUT
POWER
AMPLIFIER
AMPLIFIER
AMPLIFIER
Y FACTOR
NOISE
AMBIENT (dBm)
(-77 K)(dBm)
(dB)
FIGURE (dB)

Above data taken with Daden filter attached (except -19).

#### Intermediate test results for information only

PART NO. <u>1331562-18</u>	SPACEK QA	6-29-98 ACC REJ
SER NO. 7A 18	TEST FAILURE:	
TESTED BY: 7FH	FAILURE ANALYSI	S NO
END DATE: 6-5-98		
END TIME: 1600	Spacek Labs, 212 E. Gutie Santa Barbai	rrez St.
	•	

## TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

# NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-24-8AMBIENT ROOM TEMPERATURE °C	: +2/	/
---	-------	---

_								
UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC	REJ
_6_	4451	-19.70	-21.50	1.80	3,4	3.5	ON )	
+8	45.2	-19.80	-21,55	1.75	3.5	3.8		
+28	45.3	-20.20	-21.95	1.75	3.5	3.8	1	
+40	45.4	-20,50	-22.20	1.70	3.6	3.8	QA 1	
			ec is .5dB peak the Daden filt			CC 1	REJ	
			Y TEST: ATP ]	•				_
			nperature °C:_		<u>. J.4.J</u>		·	
Attach o	computer gen	erated <i>NE</i> △ <i>T</i> s	preadsheet to th	us test data she	eet.			
Record	the calculated	l Nps(K) from	spreadsheet dat	ta: 0,045	<u></u>			
			mber from Aero less than or equ	· . ·		•	ct.	
					(CO)	REJ		
	PART NO. <u>1:</u>	331562-18 <b>6</b>	SPA	CEK QA	<u>DATE</u>	ACC REJ		
:	SER NO	7A28	TEST	FAILURE:				
•	TESTED BY	: 79	FAILUR	E ANALYSIS	NO			
]	END DATE:	6-25-98	<del></del>					
	END TIME:	1600	·	Spacek Labs, 212 E. Gutier Santa Barbar	rez St.	Į.		

Channels 9-14 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-19, S/N: 7A39)

			-
			<u>.</u> .

#### TEST DATA SHEET NO. 6. AMPLIFIER TESTS

### GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS

SPEC. GAIN FLATNESS

(dB)ppK

(dB)ppK

0.70

0.50

**ACC** 



## GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

 $\Delta G/\Delta V$ 

2.0

AMPLIFIER

GAIN

**VOLTAGE** 

READING (dBm)

SPEC.  $\Delta G/\Delta V$ 

ECN

9,96 10.00

> 10.04  $\Delta G_V =$

2.0

CAMSU-1352\_

DATE ACC REJ

REJ

PART NO. 1331562-196

SPACEK QA



SER NO.

TESTED BY:

TEST FAILURE:

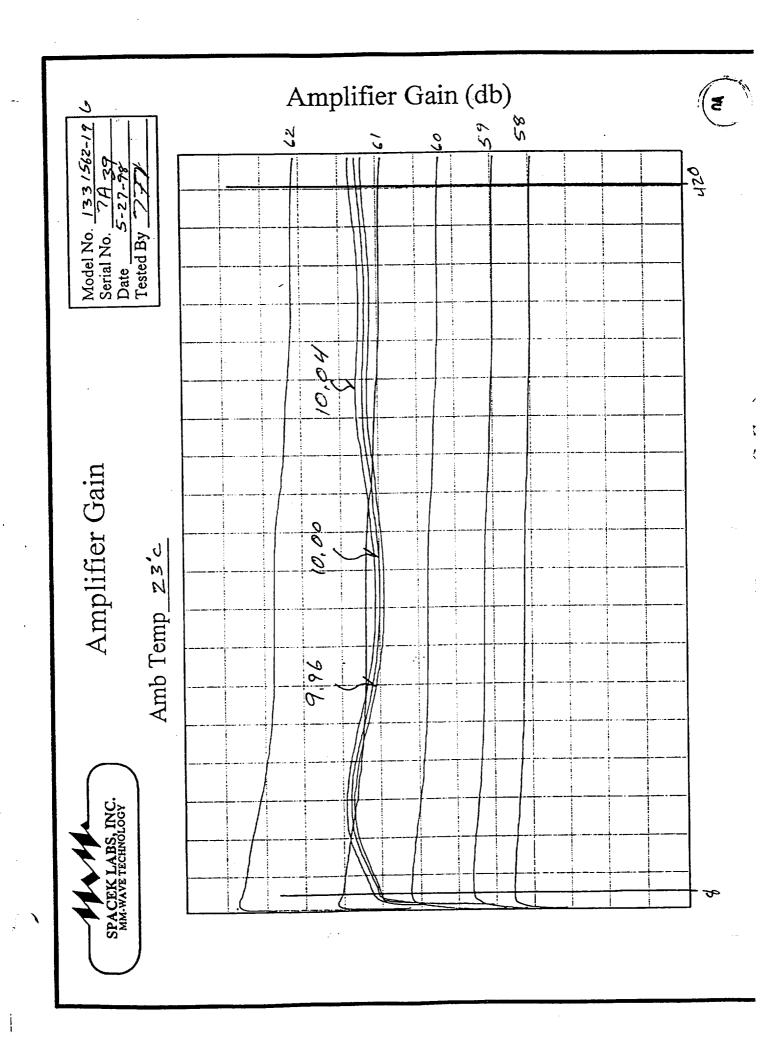
FAILURE ANALYSIS NO. \_\_\_\_

END DATE:

Spacek Labs, Inc. 212 E. Gutierrez St.

1600 END TIME:

Santa Barbara, CA, 93101



#### TEST DATA SHEET NO. 7. AMPLIFIER TESTS

## GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal	Temperature	Relat	ive Gain	ΔG/ΔT	SPEC	ACC	REJ
T1	- 6	GT1	62,27				
				* 0.028	0.035dB/°C	a.	
T2	+3	GT2	61.88				<i>i</i> .
				• 0,036	0.020dB/°C		1 40
T3	128	Gтз	61.17				1
				. 0,049	0.035dB/°C		OF
T4	+40	GT4	60,58				レ

ECN CAMSU - 1355

\* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}}$$

$$i = 1,2,3,4$$

$$\Delta G_T = \frac{2.69}{4.69} - dB$$

 $\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 2.25$  dB Spec 1.4dB ACC\_

ACC\_\_\_\_REJ\_\_\_

ECN CAMSU-135Z

PART NO. <u>1331562-176</u> SPACEK QA

TEST FAILURE:

TESTED BY:

FAILURE ANALYSIS NO.

END DATE: 6-5-98

Spacek Labs, Inc. 212 E. Gutierrez St.

END TIME: 1600

Santa Barbara, CA, 93101

The another (NAhr)

#### TEST DATA SHEET NO. 8. AMPLIFIER TESTS

## OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

$\mathbf{r}$	٨	CLI	#
1)	А	>н	#

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm	) ACC REJ
X X X X X X X X X	10	-2.5	0.5	1,0	(( <u>3</u> -)
X	20				. `
X X	50				
XXXXXXX	100			<u> </u>	
X	150				/ <b>~</b> \-
X X X X X X	200	-2,5	0.5	1.0	
X	400	-2.3	0,7	1.0	<b>8</b> 4 )
X	500				
· X	1000				
X	1500				

## AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER	AMPLIFIER		
OUTPUT	OUTPUT		AMPLIFIER
POWER	POWER	Y FACTOR	NOISE
AMBIENT (dBm)	(-77 K)(dBm)	(dB)	FIGURE (dB)
261	- ~ ~	_	1.27
- 25.4	-28,9	3,5	1.41

Above data taken with Daden filter attached (except -19) .

#### Intermediate test results for information only

PART NO. <u>133</u>	1562-19 <i>G</i>	SPACEK QA	G-30-98 &
SER NO	7A39	TEST FAILURE:	<u></u>
TESTED BY:	771	FAILURE ANALYSI	S NO
END DATE:	6-5-98		
END TIME:	1600	Spacek Labs, 212 E. Gutie Santa Barba	rrez St.

# TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

## NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-24-98AMBIENT ROOM TEMPERATURE °C:_	+1 (	
DATE: 6-24-70AIVIBLEIVI ROOM TEMIELUTOLE O.		-

UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC	REJ '
-6	57.0	-24.20	-26.10	1.90	3.2	3.8		)
+8	57,0	-24.50	-26.40	1.90	3:2	3.8	LA DA	
+28	51.0	-24.90	-26.80	1.90	3.2	3.8	1	
+40	51.2	-25,30	-27.15	1.85	3.3	38	<u>1</u>	
Noise fi	gure change_ <i>Above data</i>	<u>(),                                    </u>	nec is .5dB peal th the Daden file	to peak on ter, except or	-20 A0 n the -19 unit.	cd i	REJ	

# NEAT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 6-22-98 Ambient Room Temperature °C: 24

Attach computer generated  $NE \Delta T$  spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.042

Record Nps(K) 0.07 for dash number from Aerojet specification AE-24869, Table II.

Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

TESTED BY: 777 END DATE: 6-26-98 END TIME: 1606	Spacek Labs, Inc. 212 E. Gutierrez St.
PART NO. <u>1331562-196</u> SER NO. 7A39	SPACEK QA  DATE ACC REJ  SPACEK QA  TEST FAILURE:

Channel 9 Amplifier

IF Amplifier (P/N:1331579-8, S/N: 105)

			_

#### APPENDIX C ATP1772 DATA SHEET MODEL NUMBER VD722301 AEROJET P/N 1331579-8

# s/n 105

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept_X Reject		1400	12-5-90
4.2.2	* Current Limiting	200 mA maximum  Reg. VOLTAGE= 6.64 VDC  Total R= 57.0 ohm  max. current draw =	116,5ma			6 r a
4.4	Electrical Test					9-19-94
4.4.1	* Polarity Reversal Protection	No Damage	Current 35 mA Accept x Reject			12-5-96
	Short Open Protection	No Damage	Accept X Reject			12-5-96
	Output Coupling	Output shall be AC coupled	Accept X Reject			12-5-90
4.4.2	Gain vs. Freq. 5 MHz to 200 MHz	14.5dB Min., 15.5dB Max. -4°C to +40°C Attach x-y plot	Max  5,24 dB Min  5,09 dB Accept X Reject	Max 15.18 dB Min 15.02 dB Accept X Reject	Max <u> 5.17</u> dB Min <u> 5.12</u> dB Accept_X Reject	12.540
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject dB	Accept X Reject 0:17 dB	Accept X Reject	12-5-94
	Gain Temp. Sensitivity	+.22 dB from -4°C to +40°C Worse Case	Accept Reject	Accept X Reject 0.10 dB	Accept X Reject 0.05 dB	12-5-%
4.4.3	Gain-Voltage Sensitivity	<pre>≤.5dB/v Worse Case</pre>	0.05 dB 34,5 mA 35,4 mA	0.03 dB 314 mA 320 mA	0,02 dB 37,2mA 37,9 mA	
	Input Currents	40ma MAX. 8.4v Attach X-Y Plot	Accept A	32.7 mA Accept X Reject	Accept X Reject	385mA 12-59g
	+ MEGA PROVIEN				L	<u>                                       </u>

NOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

Amplica, Inc.					
Newbury Park, CA 91320	SIZE	FSCM NO	•		REV.
DRAWN	Α	510	25	ATP1772	B
ISSUED	SCALE			SHEET 34 OF 38	

RED. Q/ATP 3.2.1.3 5.2.1 GPERATING TEMPERATURE 35.5 C P 3.2.1.3 5.2.3 CENTER FREQUENCY & CENTER FREQUENCY & CENTER FREQUENCY STABILITY LD: 317.535/317.865 WHz 326.733 WHz P HI: 326.535/326.865 MHz 326.733 WHz P 3.2.1.5 5.2.4 3 dB BANOWIDTH: LD: 2.8/3.0 MHz 2.955 WHz P HI: 2.8/3.0 MHz 2.955 WHz P 3.2.1.6 5.2.5 PASSBAND SYMMETRY LD: /0.5 dB	ELECTRICAL TEST DATA SHEET  AEROJET PART: 1331576-4 PHONON PART: 18826 SERIAL: B87  TESTED BY: 210 TITLE: 165/16/15 DATE: 5/12/54 TIME: 11:00000  TEST: FINAL FUNCTIONAL								
RED. 9/ATP 3.2.1.1 5.2.1 GPERATINE TEMPERATURE 3.2.1.3 5.2.3 CENTER FREDLENCY & 3.2.1.4 CENTER FREDLENCY STABILITY LD: 317.535/317.865 WHz HI: 326.535/326.865 WHz 3.2.1.5 5.2.4 3 dB BANDHIDTH: LD: 2.6/3.8 WHz HI: 2.8/3.8 WHz HI: 2.8/3.8 WHz HI: 2.8/3.8 WHz LD: 9.5 dB HI: /8.5 dB DESS.575-327.825 WHz: /1.8 dB B.3 dB DP 3.2.1.7 5.2.6 PRESENDO RIPPLE 316.575-318.825 WHz: /1.8 dB B.3 dB DP 3.2.1.8 5.2.7 INSERTION LOSS LD: 27.8/38.2 dB HI: 27.8/38.2 dB HI: 27.8/38.2 dB HI: 27.8/38.2 dB B.2 dB DP 3.2.1.9 5.2.8 INSERTION LOSS VARIATION LD: -0.4/8.4 dB HI: -0.4/8.4 dB B.2 dB DP 3.2.1.10 5.2.9 GMPLITIDE BALANCE LD, HI: /8.5 dB 3.2.1.11 5.2.10 OUT-OF-BAND REFECTION BAND WIDTH: 1-313, 331-1000 MHz: DUAL: 313.600-315.585, 328.815-331.0 WHz: 39.7 dB WIDTH: /8.5 dB 3.2.1.12 5.2.11 SAMPE FACTION LD: /1.30 Unitless HI: /1.	ELUIPMEN			L: <u>3410904374</u> L: <u>21369831</u> 27	<u> </u>	AL DUE: <u>1/</u> AL DUE: <u>7/</u>	129/ <b>99</b> 17/98		
3.2.1.1 5.2.1 OPERATING TEMPERATURE 3.2.1.3 5.2.3 CENTER FREQUENCY & 3.2.1.4 CENTER FREQUENCY & 13.7.552/317.865 MHz 13.8.55/317.865 MHz 13.8.55/317.865 MHz 13.8.5.35/317.865 MHz 2.949 MHz 11.2.8/3.8 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.955 MHz 2.958 MHz 2.955 MHz 2.				ENT TITLE		DATA		P/F	
CENTER FREQUENCY STABILITY	3.2.1.1	5. 2. 1	OPERATING TE			35.5	_ c	Р	
HI: 326.535/326.865 MHz   325.733 MHz   P			CENTER FREEL	ENCY STABILIT	Υ	347 346		_	
3.2.1.5 5.2.4 3 dB BRMONIDH:  LD: 2.8/3.0 MHz  HI: 2.8/3.8 MHz  3.2.1.6 5.2.5 PASSBAND SYMMETRY  LD: /0.5 dB  HI: 0.5 dB  HI: 0.5 dB  3.2.1.7 5.2.6 PASSBAND SYMMETRY  216.575-318.825 MHz: /1.8 dB  3.2.1.8 5.2.7 INSERTION LOSS  LD: 27.8/38.2 dB  3.2.1.8 5.2.7 INSERTION LOSS  LD: 27.8/38.2 dB  3.2.1.9 5.2.8 INSERTION LOSS VARIATION  LD: -0.4/0.4 dB  HI: -0.4/0.4 dB  HI: -0.4/0.4 dB  HI: -0.4/0.4 dB  S.2.1.10 5.2.9 AMPLITUDE BRIANCE  LD, HI: /0.5 dB  3.2.1.11 5.2.10 OUT-OF-BAND REJECTION  BAND  BAND  BAND  BAND  BAND  PEAK(dB)  MIDTH(MHz)  WIDTH: /0.5 dB  3.2.1.12 5.2.11 SHOPE FACTOR  LO: /1.30 Unitless  HI: /1.30 Unitless  HI: /1.30 Unitless  HI: /1.30 Unitless  J.24 Unitless  HI: /1.30 Unitless  HI: /1.30 Unitless  DUAL SI: 7.5/ dB  DUAL SI:			HI: 326.535/	326.865 MHz				P	
LO: /0.5 dB	3.2.1.5	5. 2. 4	LO: 2.8/3.0	摊{z		2.949	Miz	P	
Hi: 78.5 dB	3.2.1.6	5.2.5	HI: 2.8/3.0 PASSBAND SYM	MHZ METRY				P	
3.2.1.7 5.2.6 PASSBAND RIPPLE 216.575-318.825 MHz: /1.8 dB		••				B. 3	_ dB _ dB	P	
3.2.1.8 5.2.7 INSERTION LOSS LO: 27.8/38.2 dB HI: 27.8/38.2 dB HI: 27.8/38.2 dB CO: 4.4/8.4 dB HI: 27.8/38.2 dB CO: 4.4/8.4 dB HI: -8.4/9.4 dB CO: 4.4/8.4 dB HI: -8.4/9.4 dB CO: 4.4/8.4 dB HI: -8.4/9.5 dB CO: 4.4/8.4 dB CO: 4.8/8.4  CO: 4.8/8 dB CO	3.2.1.7	5.2.6	PASSBAND RIP	PLE	4R		-		
LD: 27.8/38.2 dB	3.2.1.8	5.2.7	325.575-327,	825 MHz: /1.0	d₿	<b>0.</b> 5	_ dB	P	
Column   C	2.2.3.1		LO: 27.8/38.	2 dB		28.7		P	
HI: -0.4/0.4 dB	3.2.1.9	5,2.8	INSERTION LO	SS VARIATION			-		
3.2.1.11 5.2.18 OUT-OF-BAND REJECTION BAND PEAK(dB) WIDTH(MHz) WIDE: 1-313, 331-1880 MHz: 46.2 8.886  DUAL: 313.808-315.585, 319.815-324.585, 328.815-331.8 MHz: 39.7 dB WIDTH: /8.6 MHz 39.7 dB WIDTH: /8.6 MHz 8.842 MHz  3.2.1.12 5.2.11 SHAPE FACTOR LO: /1.38 Unitless 1.24 Unitless P HI: /1.30 Unitless 1.24 Unitless P 3.2.1.14 5.2.12 VSMR (RETURN LOSS) 316.575-318.825, 325.575-327.825 MHz DUAL S22: 7.5/ dB DUAL S23: 7.5/ dB DUAL S23: 7.5/ dB	7 2 1 1 <b>8</b>	520	HT: -0.4/0.4	ďŘ		0.2	_ dB	P	
BAND   PEAK (dB)   WIDTH (MHz)						8.1	_ ß	р	
DUAL: 313.000-315.585,	3, 6, 1, 11	7. E. 10	BA	NED .					
328.815-331.8 MHz: 39.7 8.842  PEAK: 35.0/ dB 39.7 dB P  WIDTH: /8.6 MHz 8.042 MHz P  3.2.1.12 5.2.11 SHAPE FACTOR  LO: /1.30 Unitless 1.24 Unitless P  HI: /1.30 Unitless 1.24 Unitless P  3.2.1.14 5.2.12 VSMR (RETURN LOSS)  316.575-318.825,325.575-327.825 MHz  DUAL S11: 7.5/ dB 9.6 dB P  DUAL S22: 7.5/ dB 9.6 dB P  A.8.2 5.2.14 LIMITED FUNCTIONAL TESTS  CENTER FRETMENCY: -0.1/0.1 MHz			DUAL: 313.00	0-315 <b>.58</b> 5,	46.2		B. 986		
WIDTH:			<b>328.8</b> 1	5-331.8 MHz:			8.842		
3.2.1.12 5.2.11 SHAPE FACTOR  LD: /1.30 Unitless			WIDTH: /0.	.6 Miz	39.7	dB	8.042 Mtz	P	
3.2.1.14 5.2.12 VSWR (RETURN LOSS) 316.575-318.825,325.575-327.825 MHz  DUAL S11: 7.5/ dB  DUAL S22: 7.5/ dB  DUAL S22: 7.5/ dB  4.8.2 5.2.14 LIMITED FUNCTIONAL TESTS  CENTER FREQUENCY: -0.1/0.1 MHz  3 dB BANDWIDTH: -0.06/0.06 MHz  INSERTION LOSS: -0.5/0.5 dB  NONE 5.2.15 DATO SHEET SUMMARY	3. 2. 1. 12	5. 2. 11				1.24	Unitless		
DUAL 511: 7.5/ dB	3.2.1.14	5. 2. 12	HI: /1.30 VSWR (RETURN	Unitless LOSS)		1.24	Unitless	P	
DURIL S22: 7.5/ dB 10.7 dB D  4.8.2 5.2.14 LIMITED FUNCTIONAL TESTS  CENTER FREDLENCY: -0.1/0.1 NHz 3 dB BANDWIDTH: -0.06/0.06 NHz INSERTION LOSS: -0.5/0.5 dB C dB  NONE 5.2.15 DATA SHEET SUMMARY			316.575-318.6	325 <b>, 325.</b> 575-32	27.825 1		d₿	Þ	
NUME 5.2.15 DATE SHEET SUMMARY	4.8.2	5, 2, 14	DUAL 522: 7.	5/ dB			•	P	
NUME 5.2.15 DATE SHEET SUMMARY			CENTER FREDLE	DICY: -0.1/8.1		8	•	2	
	NONE	5.2.15	INSERTION LOS	S: -8.5/0.5 d		Ö		夕	
						P	. OP	)	

PHONON CORPORATION 7 HERMAN DRIVE SIMSBURY, CT 06070

CAGE: 6Y858 TEL: 283-651-8211 FAX: 283-651-8618 3/22/99

E Fg

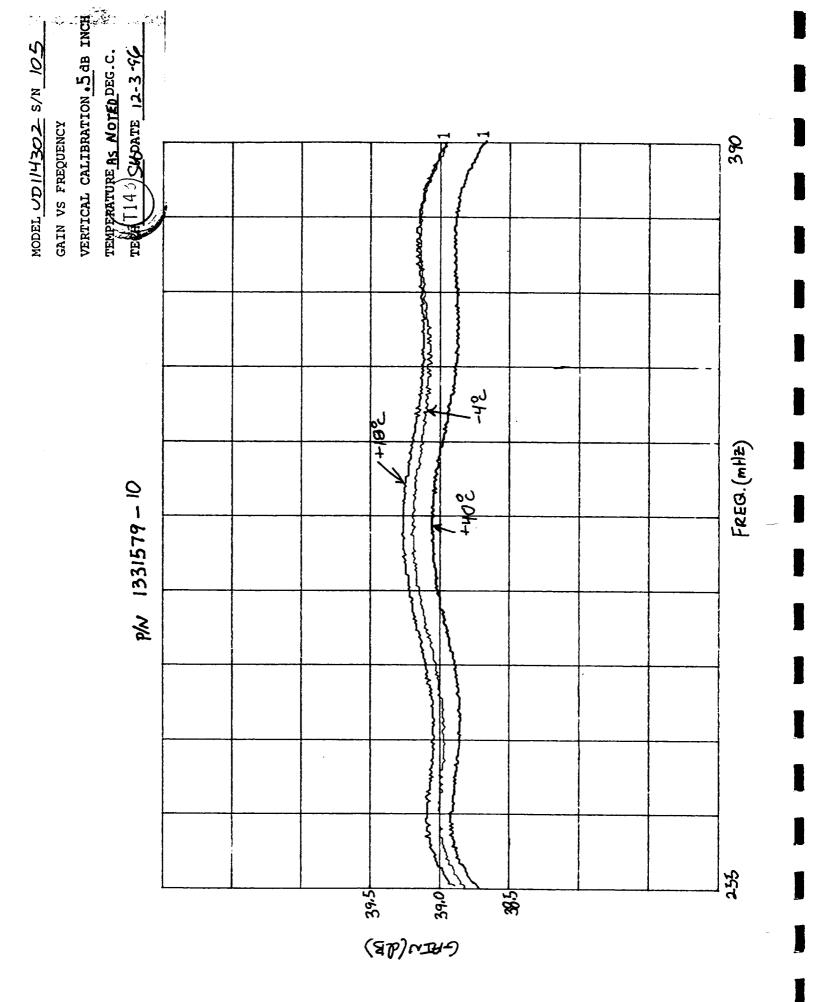
#### APPENDIX C ATP1774 DATA SHEET MODEL NUMBER UD114302 AEROJET P/N 1331579-10

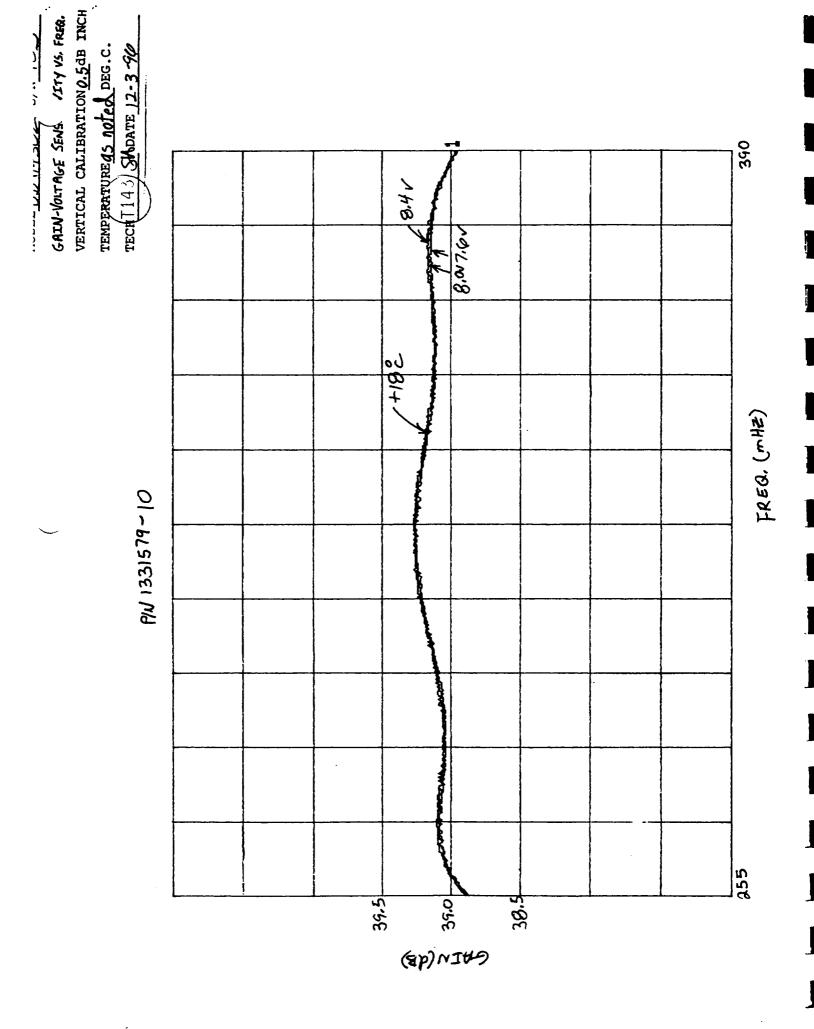
s/N 105

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C · ·	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject			
		255 MHz 322.5 MHz 390 MHz	0,70 dB 0,60 dB 0.65 dB	0.90 dB 0.82 dB	0.65 dB 0.58 dB 0.60 dB	12-4-9
4.4.8	Stability	Unconditionally Stable	Accept			12-3-8
1.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 50 mA	Accept			
		Maximum Current	42.1 mA			12-5-9

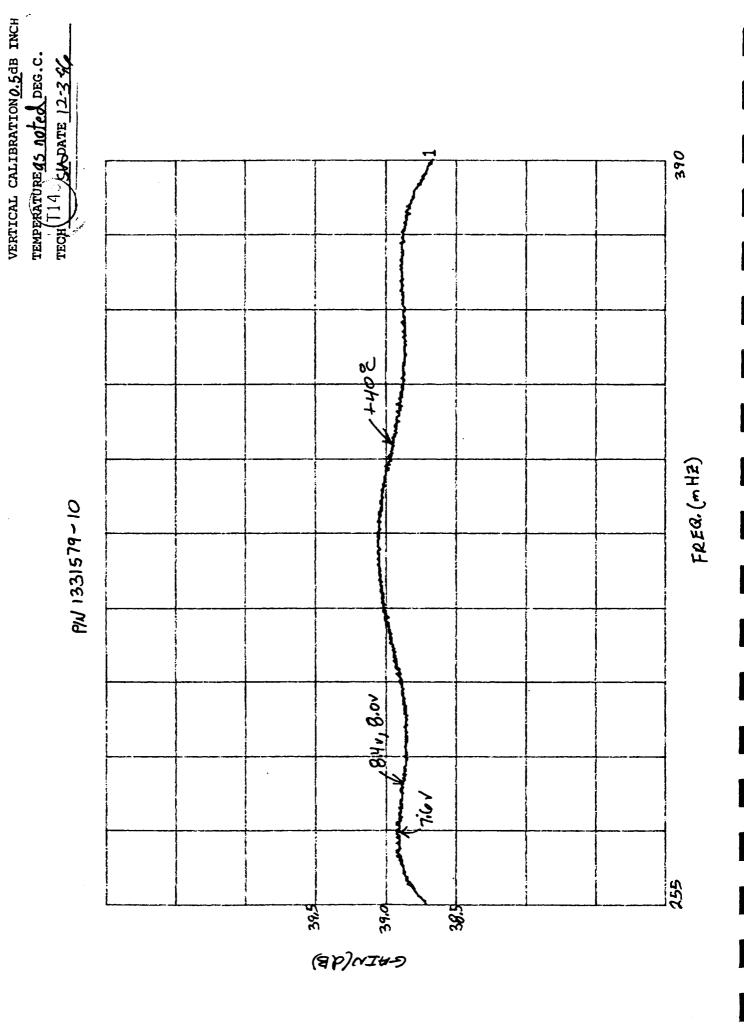
NOTE: Review all recorded	data and signify acceptance be	low.
Technician	SHAM (T143)	Date: 12-5-96
Quality Assurance	(A23)	Date: 12/9/9/
CSI: While him		Date: 12-9-96
GSI:		Date: 2/10/97

	Mamplica, Inc.								
Newbury Park, CA 91320		SIZE FSCM NO.			ΔT	ATP1774			REV.
	DRAWN	Α	510	25				B	
	ISSUED	SCALE				SHEET	37 OF	39	,





J



GAIN-VOLTAGE SENSITY - 17 VS. FRER.

		**
		-

**Channel 12 Amplifier** 

IF Amplifier (P/N:1331579-11, S/N: 111)

			-
1			

## APPENDIX C ATP1775 DATA SHEET MODEL NUMBER UD415301 AEROJET P/N 1331579-11

s/N\_\_\_\_\_

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept_X Reject		100	5-7-9
4.2.2	* Current Limiting	200 mA maximum  Reg. VOLTAGE= V/A VDC  Total R= V/A ohm  max. current draw =	<i>N/</i> A_ma	,		
4.4	Electrical Test	,				5.7-9
4.4.1	* Polarity Reversal Protection	No Damage	Current  N/A mA Accept N/A Reject			5 2 6
	Short Open Protection	No Damage	Accept_X Reject			5-7-9 5-7-9
	Output Coupling	Output shall be AC coupled	Accept_K Reject		·	5-74
4.4.2	Gain vs. Freq. 290 MHz to 355 MHz	42.5dB Min., 43.5dB Max. -4°C to +40°C Attach x-y plot	Max 43.11 dB Min 42.84 dB Accept X Reject	Max 43.15 dB Min 42.85 dB Accept_X Reject	Max 42,91 dB Min 42.46dB Accept X Reject	5-7-9
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0,27 dB	Accept X Reject O.30 dB	Accept × Reject	5-7-5
	Gain Temp. Sensitivity	+.44 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.06 dB	Accept X Reject 0.2 dB	5-7-8
1.4.3	Gain-Voltage Sensitivity	'≤.5dB/v Worse Case + .2dB for 7.6v 7.6 to 8.4 Vdc 8.0v	0,03dB 40,7 mA 41,4 mA	0.04 dB 39,4 mA 40./ mA		
	Input Currents	50ma MAX. 8.4v Attach X-Y Plot	H2.0 mA Accept X Reject	40.7mA Accept X Reject	U3.2 mA Accept × Reject	5-7.9

MOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

©Amplica,Inc.					
Newbury Park, CA 91320	SIZE	FSCM NO			REV.
DRAWN	Α	510	25	ATP1775	
ISSUED	SCAL	E		SHEET 35 OF 30	3

# APPENDIX C ATP1775 DATA SHEET MODEL NUMBER UD415301 AEROJET P/N 1331579-11

s/n\_\_\_||

PARA	TEST	SPECIFICATION	+18°C	-4°C		
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X	-4-0	+40°C	DATE
		290 MHz 322.5 MHz 355 MHz	0,40dB 0,40dB 0,45dB	0,40 dB 0,45 dB 0,55 dB	0.40 dB 0.40 dB 0.40 dB	<u>5-7-97</u>
4.4.8	Stability	Unconditionally Stable	Accept Reject			<u>5-74</u> 7
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 55 mA	Accept_X Reject		• .	I.G.a.
						5 <del>.8</del> .97

NOTE: Review all recorded data and signify acceptance below.

Technician Date: 5-8-97

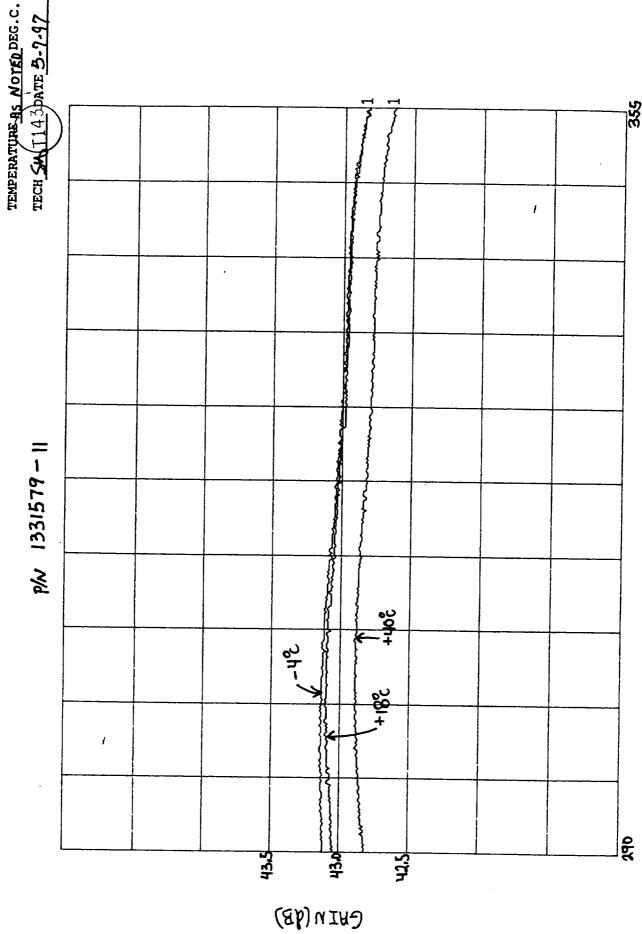
Quality Assurance Date: 5-12-7

CSI: Date: 5-14-97

GSI: Date: 5/9/97

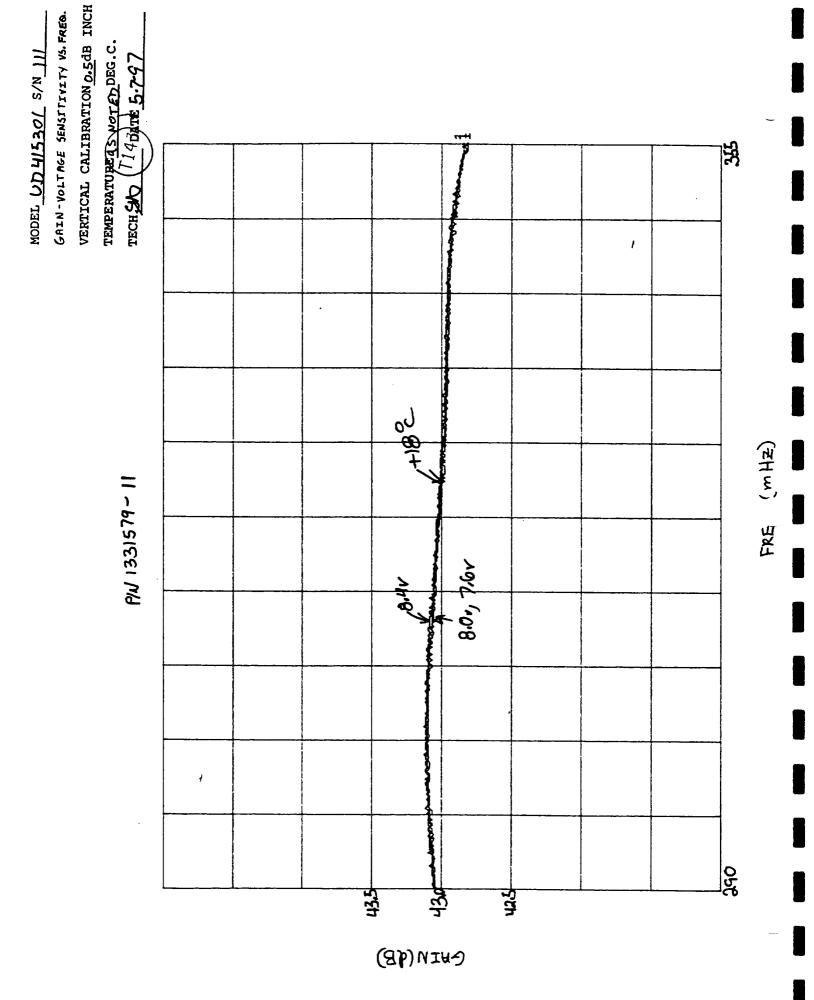
Amplica, Inc.	]		
Newbury Park, CA 91320	SIZE FSCM NO.	ATP1775	REV.
DRAWN	A 51025	AIPI//5	
ISSUED	SCALE	SHEET 37 OF 3	9

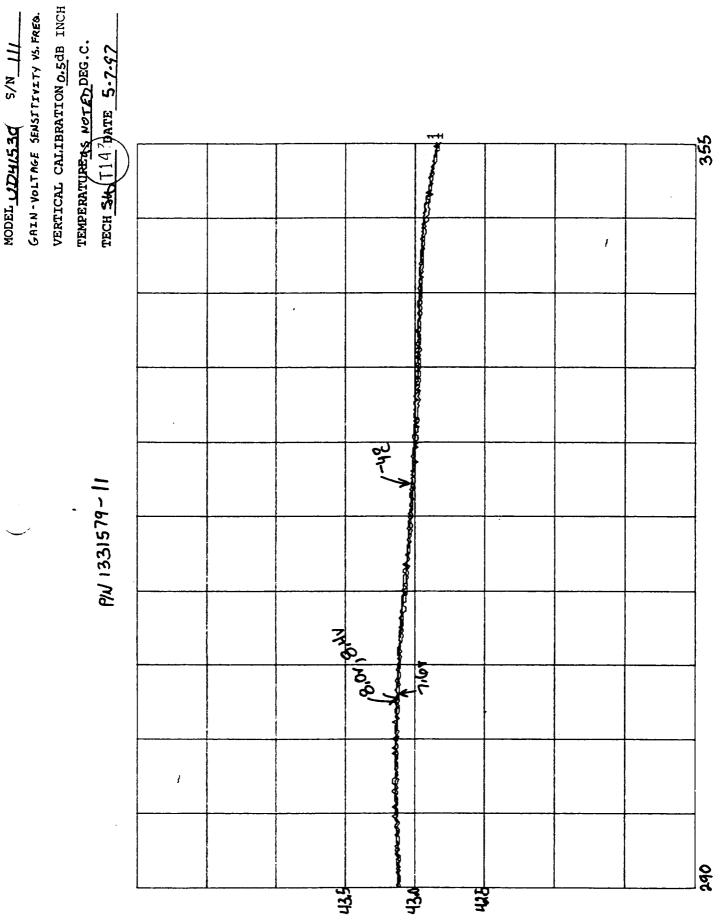
FORM 157



VERTICAL CALIBRATION . 5 dB INCH

MODEL <u>UD4153d</u> /N\_III GAIN VS FREQUENCY





CHIN(4B)

FREG. (MHZ)

**Channel 13 Amplifier** 

IF Amplifier (P/N:1331579-12, S/N: 105)

## APPENDIX C ATP1776 DATA SHEET MODEL NUMBER UD315301 AEROJET P/N 1331579-12

# s/N 105

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			12-48
4.2.2	* Current Limiting  Electrical Test	200 mA maximum  Reg. VOLTAGE= 6.57 VDC  Total R= 53.2 ohm  max. current draw =	<u>123,5</u> ma			9-19-96
4.4.1	* Polarity Reversal Protection	No Damage	Current   YOH mA   Accept X   Reject			12-496
	Short Open Protection	No Damage	Accept × Reject			12-4.96
	Output Coupling	Output shall be AC coupled	Accept_X Reject			12-4-96
4.4.2	Gain vs. Freq. 305 MHz to 340 MHz	44.5dB Min., 45.5dB Max. -4°C to +40°C Attach x-y plot	Max 45,16dB Min 44,62dB Accept x Reject	Max 45.20 dB Min 44.38 dB Accept X Reject	Max 44.93dB Min 44.63dB Accept X Reject	1 <u>2-4-9</u> 0
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.25 dB	Accept X Reject 0.23 dB	Accept X Reject	124-96
	Gain Temp. Sensitivity	+.44 dB from -4°C to +40°C Worse Case	Accept <u> </u>	Accept X Reject dB	Accept X Reject	12-4-96
4.4.3	Gain-Voltage Sensitivity Input Currents	<pre></pre>	.02 dB _39,4 mA _40.1 mA _40.7 mA Accept X Reject	.03 dB 37.7 mA 38.4 mA 39.0 mA Accept × Reject	.03 dB	12-4-EG

MOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

Amplica, Inc.						_			
Newbury Park, CA 91320	SIZE	FSCM NO	•	AT	P1776				REV.
DRAWN	Α	510	25						$\mathbb{B}_{-}$
ISSUED	SCAL	E			SHEET	35	OF	39	

### APPENDIX C ATP1772 DATA SHEET MODEL NUMBER VD722301 AEROJET P/N 1331579-8

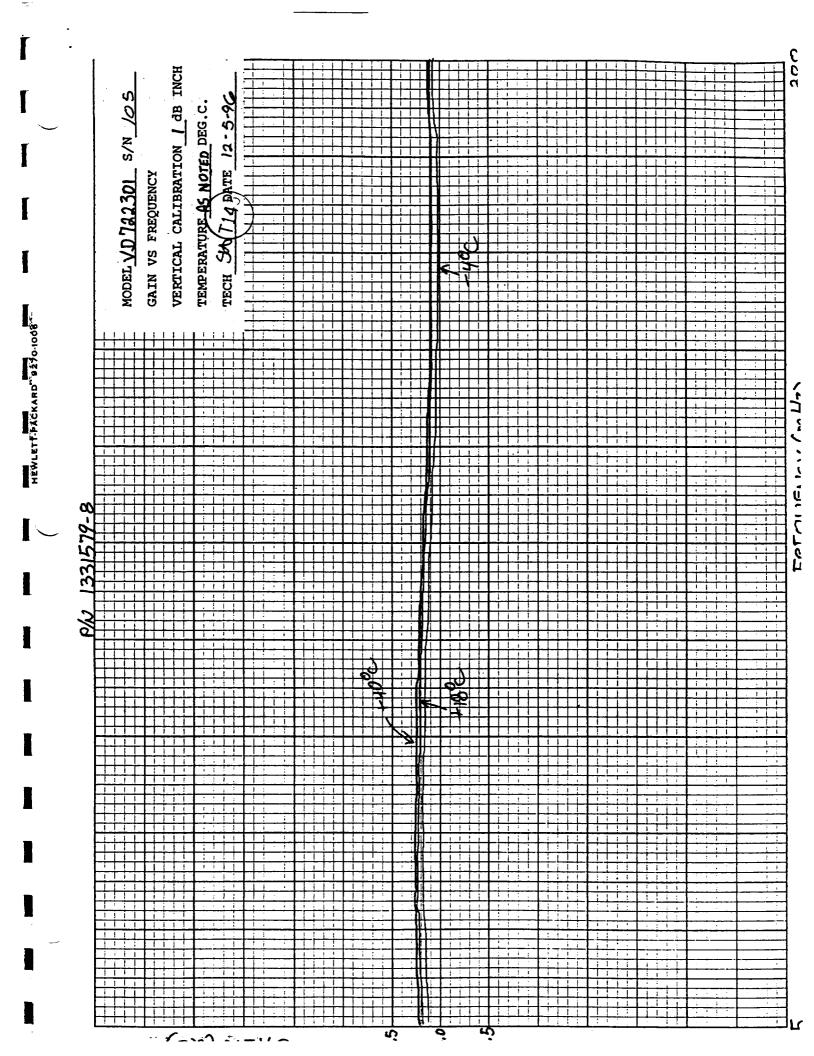
# s/N 105

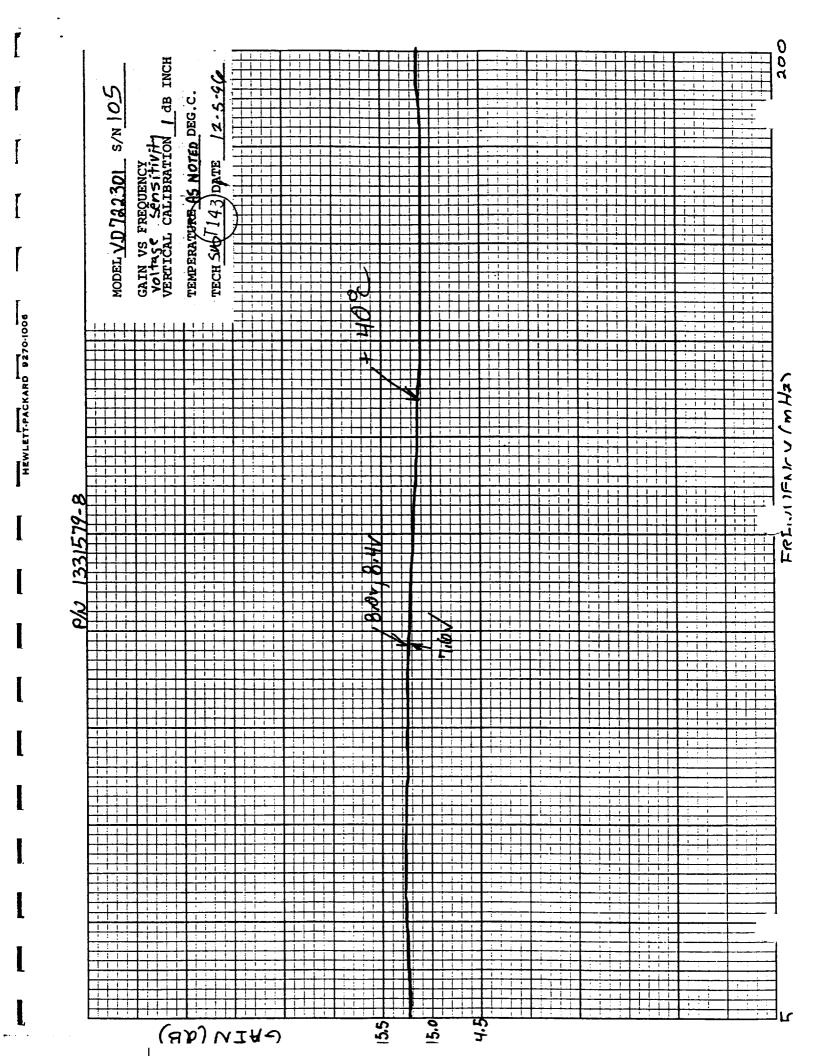
PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept	·		
		5 MHz 102.5 MHz 200 MHz	.20 dB .20 dB .20 dB	.25 dB .40 dB .25 dB	.15 dB .20 dB .20 dB	12/4/91
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept_X Reject			<u>12.5.</u> 90
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject Y0, YmA			12-5-96
		Maximum Current				2-3-79

NOTE: Review all recorded data and signify acceptance below.

Technician	SNoff (T143).	Date: 12-5-90
Quality Assurance / Sta	A23)	Date: 12/9/96
Quality Assurance CSI:		Date: 12-9-26
GSI:		Date: 2/10/97

©Amplica,Inc.	7				
Newbury Park, CA 91320	SIZE	FSCM NO	).		REV.
DRAWN	A	510	25	ATP1772	B
ISSUED	SCAL	.E		SHEET 36 OF 3	8





**Channel 10 Amplifier** 

IF Amplifier (P/N:1331579-9, S/N: 111)

### APPENDIX C ATP1773 DATA SHEET MODEL NUMBER VD622301 AEROJET P/N 1331579-9

# S/N\_\_\_\_\_

PARA	TEST	SPECIFICATION	+18°C	-4°C	·	
4.1.1	Examination of Product		Accept_X Reject_	-4°C	+40°C	5-79
4.2.2	* Current Limiting	200 mA maximum  Reg. VOLTAGE= N/A VDC  Total R= N/A ohm  max. current draw =				
4.4	Electrical Test					5-747
4.4.1	* Polarity Reversal Protection	No Damage	Current  NA mA  Accept NA			
	Short Open Protection	No Damage	Accept X Reject			5-7-57
	Output Coupling	Output shall be AC coupled	Accept X			5-7-5
4.4.2	Gain vs. Freq. 150 MHz to 300 MHz	17.5dB Min., 18.5dB Max. -4°C to +40°C Attach x-y plot	Max [8,13 dB Min 18.00 dB Accept X Reject	Max 18.05dB Min 17.92dB Accept K Reject	Max   B.   dB Min   B. O dB Accept × Reject	5-7-9)
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject O.13 dB	Accept X Reject O-13 dB	Accept X Reject O//5 dB	5.7.97
	Gain Temp. Sensitivity	+.22 dB from -4°C to +40°C Worse Case	Accept_X Reject	Accept X Reject 0.09 dB	Accept X Reject 0.05 dB	5-79
1.4.3	Gain-Voltage Sensitivity Input Currents	<pre>≤.5dB/v Worse Case</pre>	0.01 dB 33.4 mA 34.4 mA 34.7 mA	O.O dB 30.7 mA 31.4 mA 32.0 mA	0,01 dB 36,2 mA 36,9 mA	
		Attach X-Y Plot	Accept X Reject	Accept × Reject	37.5 mA Accept × Reject	5-7-57

NOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

Amplica, Inc.				
Newbury Park, CA 91320	SIZE	FSCM NO		REV.
DRAWN	TA.	510	ATP1773	
ISSUED	SCAL	£	 SHEET 34 OF 3	2

#### APPENDIX C ATP1773 DATA SHEET MODEL NUMBER VD622301 AEROJET P/N 1331579-9

s/N\_\_\_\_\_

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power 150 MHz 225 MHz 300 MHz	Accept X Reject	0,40 dB 0,40 dB 0,40 dB	0.25 dB 0.20 dB 0.30 dB	<u>5-7-9</u> 7
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject		·	<u>5-7-97</u>
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA  Maximum Current	Accept X Reject			5.8.97

NOTE: Review all recorded data and signify acceptance below.

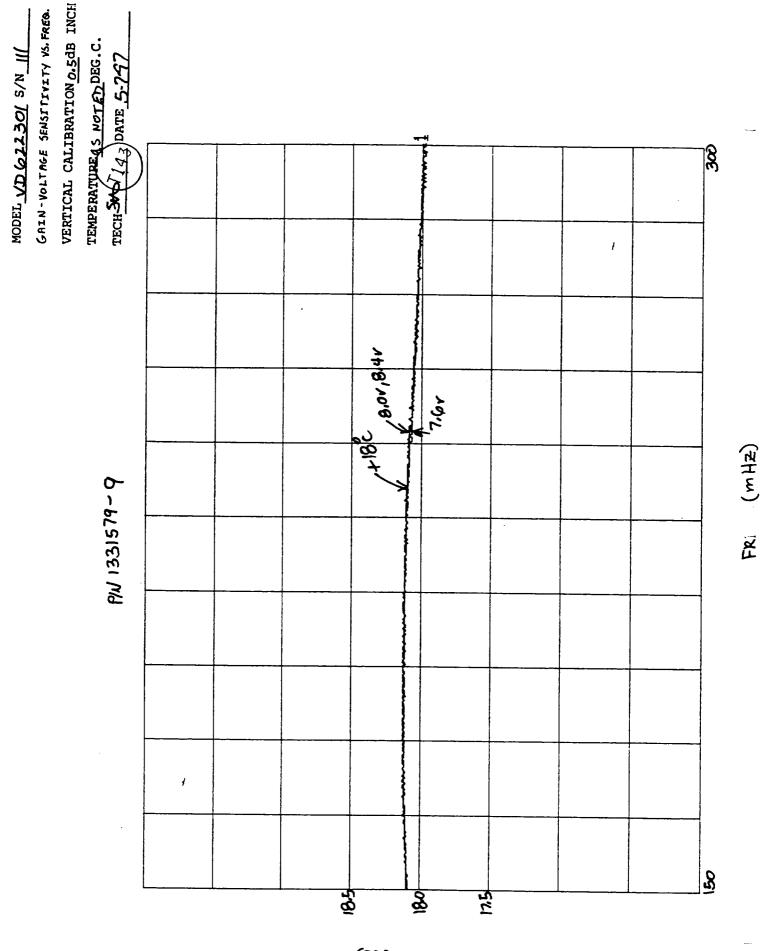
Technician	Stolland	(T143):	Date: 59.97
Quality Assurance Sure	Luna		Date: 5-12-97
CSI: Will Triend		(120)	Date: 5-14-97
GSI:			Date: <u>5/9/97</u>
			_

 Amplica, Inc.
 Newbury Park. CA 91320
 SIZE FSCM NO.
 REV.

 DRAWN
 A 51025
 ATP1773

 ISSUED
 SCALE
 SHEET 36 OF 38

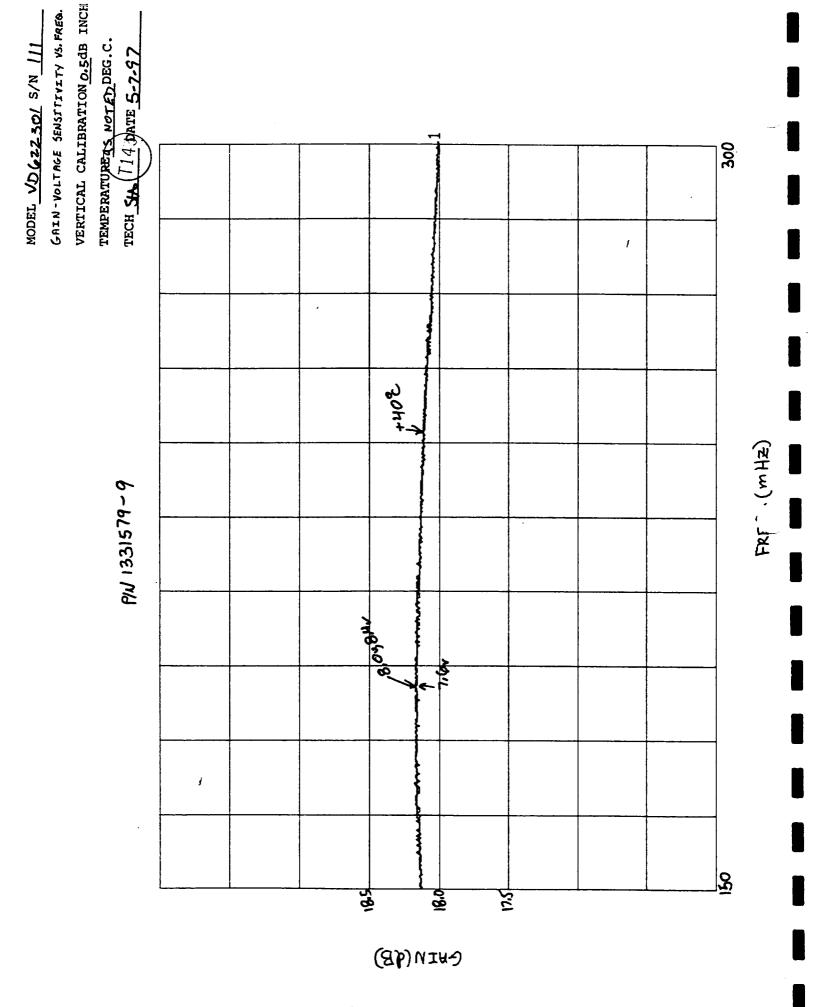
FREG, (MHZ)



CHIN(qB)

FREG. (mHZ)

CHIN(4B)



Channels 11-14 Amplifier

IF Amplifier (P/N:1331579-7, S/N: 111)



### APPENDIX C ATP1771 DATA SHEET MODEL NUMBER UD122301 AEROJET P/N 1331579-7

# s/N\_\_\_||

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	1 53.00
4.1.1	Examination of Product		Accept_X Reject			5-7-9
4.2.2 4.4	* Current Limiting  Blectrical Test	200 mA maximum  Reg. VOLTAGE=	<i>N/</i> A_ma			<u>5-7-9</u>
1.4.1	* Polarity Reversal Protection	No Damage	Current  N/A mA  Accept A/A  Reject			5-7-1
	Short Open Protection	No Damage	Accept X			5-7-
	Output Coupling	Output shall be AC coupled	Accept_X Reject			5.7.
1.4.2	Gain vs. Freq. 255 MHz to 390 MHz	14.5dB Min., 15.5dB Max. -4°C to +40°C Attach x-y plot	Max 15, 14 dB Min/4.76 dB Accept x Reject	Max (5,/3 dB Min (4,75 dB Accept Reject	Max 15,18dB Min 14,70dB Accept x Reject	5-7-9
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject  0.38 dB	Accept × Reject 0.38 dB	Accept X Reject O.48 dB	5-74
	Gain Temp. Sensitivity	+.22 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject O.O4 dB	Accept X Reject 0.06 dB	5-7-
.4.3	Gain-Voltage Sensitivity Input Currents	<pre>&lt;.5dB/v Worse Case</pre>	0,0  dB 33.8 mA 34.5 mA 35.1 mA	0.01 dB 30.6 mA 31.3 mA 31.9 mA	000 dB 36.6 mA 37.3 mA 37.9 mA	
		Attach X-Y Plot	Accept K Reject	Accept V	Accept X Reject	5.79

NOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

Mamplica, Inc.					
Newbury Park, CA 91320	SIZE	FSCM NO		R	EV.
DRAWN	Α	510	25	ATP1771	
ISSUED	SCAL	.E		SHEET 35 OF 39	

### APPENDIX C ATP1771 DATA SHEET MODEL NUMBER UD122301 AEROJET P/N 1331579-7

s/n\_\_\_\_\_

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject			
		255 MHz 322.5 MHz 390 MHz	0.15 dB 0.20 dB 0.20 dB	0.20 dB 0.20 dB 0.20 dB	0.15 dB 0.20 dB 0.20dB	5-7-57
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept ×		·	<u>5-7-9</u> 7
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA  Maximum Current	Accept X Reject			5-8 <i>97</i>

NOTE: Review all recorded data and signify acceptance below.

Technician

Ouality Assurance

CSI:

Date: 5.8.97

Date: 5.72.57

Date: 5/9/97

Date: 5/9/97

Amplica, Inc.	1				
Newbury Park, CA 91320	SIZE	FSCM NO			REV.
DRAWN	A	510	25	ATP1771	
ISSUED	SCAL	E	<del></del>	SHEET 37 OF	39

		Noise Figure		Power Stabil			3.5.4) (A1-1)	)	
Test Set	ıp Verified:_	7. Yr Signa		Baseplat	e Temperatu	re (T <sub>B</sub> ) <u>28.</u>	<u>0</u> ℃ P	LO No. 1	
<del> </del>	NF (dB)						NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
10		4.16				0.066			
		4.14				0.124			
		4.16				0.094			
		4.15				0.050			
		4.15				0.044			
		4.16				0.076			
	i i	4.16				0.129			
		4.16				0.108			
		4.15				0.112			
		4.16		76.74		0.083			
	4.7		4.15	Pass	0.12		0.088	0.085	Pass
	<u> </u>							Pass = P,	Fail = F
			,			<b>√</b> (	1.1		
Part No.:	25/	6429 -	- /	<del></del>		eer: <u> </u>	_		
Serial No	o.:	504				surance:	$\sim$	N 22 79	
					Date:	1/20/	199		

# FOR REFERENCE ONLY

#### AMSU-A TEST

A1-1, S/N: F04, CH10, PLO #1, NF & NPS DATA, TB=28 C, 1/20/99

SEQ	TEMP_TEST		VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	92993372	.00027515		
2	COLD TEST	79.15	66573550	.00022788	4.15626031	.06625112
3	WARM TEST	295.15	92979144	.00030368		
4	COLD TEST	79.15	66473903	.00020445	4.14147690	.12386157
5	WARM TEST	295.15	92983311	.00028714		
6	COLD TEST	79.15	66576672	.00017937	4.15796961	.09440677
7	WARM TEST	295.15	92976379	.00025561		
8	COLD TEST	79.15	66535218	.00019614	4.15193098	.05023328
9	WARM TEST	295.15	92931463	.00026820		
10	COLD TEST	79.15	66509460	.00019298	4.15298736	.04387995
11	WARM TEST	295.15	92931425	.00024599		
12	COLD TEST	79.15	66522410	.00017985	4.15513565	.07559061
13	WARM TEST	295.15	92931068	.00030614		
14	COLD TEST	79.15	66528762	.00019421	4.15622973	.12850343
15	WARM TEST	295.15	92978137	.00029393		
16	COLD TEST	79.15	66588181	.00018455	4.16048963	.10757693
17	WARM TEST	295.15	92948809	.00029639		
18	COLD TEST	79.15	66526258	.00021578	4.15371296	.11200331
19	WARM TEST	295.15	92978638	.00028159		
20	COLD TEST	79.15	66575518	.00023875	4.15833263	.08251617

CH. 10 ,75.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.15445543252

NOISE POWER STABILITY (K) = .0884823143342

NOISE POWER STABILITY DELTA (K) = .0846234868218

 $NPS_MAX(K) = .12850343401$   $NPS_MIN(K) = .0438799471885$ 

INTEGRATION TIME = .165

TEST DATA SHEET 10 (Sheet 5 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Compo- Channel		V <sub>b</sub> (V)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub> (V)		T <sub>C</sub> (°C)	Vc	V <sub>c</sub> (V)	
nent	No.	-5(-)	·B(··········)		Mean	Standard Deviation		Mean	Standard Deviation	
		Posi- tive		22.0	-1.035	.000319	-194.0	7518	.000338	
				22.0	-1.035	.000334	-194.0	-7536	.000221	
		+15,13	528.7	22.0	-1.035	.0003/3	-194.0	-7525	.000234	
				22.0	-1.035	.000319	-194.0	7519	000245	
LO	11	Nega- tive		22.0	-1.035	.000286	-194.0	75098	.000215	
				22.0	-1.035	.000321	-194.0	-7513	.000228	
		-15.13	-64.6	22.0	-1.035	.000315	-194.0	-7530	.000223	
				22.0	-1.034	.000267	-194.0	-7532	.000226	
				22.0	-1.034	.000334	-194.0	-7517	.000280	
				22.0	1.035	.000304	-194.0	-7534	.000239	
Mixer/ Amps	All	9.93	244.5							
IF Amps	Ali	7.94	268.6							

Part No.: 1356429 -/	Test Engineer: Y. Yrah
Serial No.: Fo 4	Quality Assurance: 268 JAN 22 79
	Date: 1/20/99

# TEST DATA SHEET 10 (Sheet 20 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

, Test Set	up Verified:		inh ature	Basepla	te Temperatı	ire (T <sub>B</sub> )	<b>7.0</b> ℃ 1	PLO No. 1	
NF (		(dB)		NPS (K)					
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
11		4.32	94.			0.070			
		4.35				0./03			
		4.33				0.05i			
		4.32	u.			0.092			
		4.31				0.081			
		4.32				0.074			
		4.34				0.058			
		4.35				0.115			
		4.33				0.103			
		4.34				0.022			
	4.7		4.33	Pass	.12		0.077	0.093	Pass
							1	Pass = P,	Fail = F
	42.6	/// 2 &	,					A	
Part No.:_	25/	5429-	- /			er:			
Serial No.:	F	04				rance:	<u></u>	NN 85 .04	
				1	Date:	1/20	/99		
							<del></del>	<del></del>	

# FOR REFERENCE ONLY

# AMSU-A TEST

A1-1, S/N: F04, CH11, PLO #1, NF & NPS DATA, TB=29 C, 1/20/99

SEQ	TEMP_TEST		STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15 -1.0348643		4.32181177	.06998727
2	COLD TEST	79.157517797		4.32101111	
3	WARM TEST	295.15 -1.0347902		4.35102022	.10349517
4	COLD TEST	79.157536109		4.35102022	.10545511
5	WARM TEST	295.15 -1.0349187			00117700
6	COLD TEST	79.157525182		4.33261832	.05117268
7	WARM TEST	295.15 -1.0348091	8 .00032854		
8	COLD TEST	79.157518779	8 .00024526	4.32394793	.09211026
9	WARM TEST	295.15 -1.0349260	0 .00028629		
10	COLD TEST	79.157509772	4 .00021483	4.30874755	.08134840
11	WARM TEST	295.15 -1.0347242	7 .00032070		
12	COLD TEST	79.157513167		4.31623570	.07421372
13	WARM TEST	295.15 -1.0346944			
14	COLD TEST	79.157529914	0 .00022271	4.34248038	.05845799
15	WARM TEST	295.15 -1.0344364	1		~~~~~~
16	COLD TEST			4.34788128	.11463650
. –	WARM TEST				
17		20010	· -	4.32548425	.10324300
18	COLD TEST		· · · · · · · · · · · · · · · · · · ·		
19	WARM TEST			4.34489596	.02200463
20	COLD TEST	(3.15(33336)	,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

CH. 11 ,69.5 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.33153407694

NOISE POWER STABILITY (K) = .077066962665

NOISE POWER STABILITY DELTA (K) = .0926318668716

 $NPS_MAX (K) = .114636496656 NPS_MIN (K) = .0220046297846$ 

INTEGRATION TIME = .165

# TEST DATA SHEET 10 (Sheet 6 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	V <sub>H</sub> (V)		V <sub>C</sub>	V <sub>c</sub> (V)	
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation	
LO 12		Posi- tive	528.7	22.0	-1.007	.000424	-194.0	7.7310	.000305	
		†15.i3		22.0	-1.007	000401	-194.0	-7325	.000334	
				22.0	-1.007	.000441	-194.0	-7317	.000311	
				22.0	-1.006	.000435	-194.0	7308	.000294	
	12			22.0	-1.006	.000437	-194.0	7324	.000335	
		Nega- tive	-64.6	22.0	-1.007	.000 420	-194.0	7301	.000362	
				22.0	-1.006	.000502	-194.0	7302	.000302	
				22.0	-1.006	.000509	-194.0	-7320	.000 298	
				22.0	1.006	.000454	-194.D	-7310	.000377	
				22.0	-1.006	.000430	-194.0	-7311	.000394	
Mixer/ Amps	All	9.93	244.5							
IF Amps	All	7.94	263.6							
	13564						7. Y.			

# TEST DATA SHEET 10 (Sheet 21 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	7. Vrinh Signature	Baseplate Temperature (T <sub>B</sub> ) <u>29.0</u> °C	PLO No. 1
	8		

		NF	(dB)				NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
12	-	4.31				0.110			
	:	4.34				0.155			
		4.33				0.055			
		4.32				0.078			
:		4.34				0.073			
		4.30				0.118			
		4.31				0.180			
		4.34				0.192			
·		4.32				0.067			
		4.32				0.094			
	4.7		4.32	Pass	0.18		0.112	0.137	Pass

Pass = P, Fail = F

Engineer: Y. Drink
ity Assurance: (892) yy 22 '99
: 1/20/99
ıl

#### AMSU-A TEST

A1-1, S/N: F04, CH12, PLO #1, NF & NPS DATA, TB=29 C, 1/20/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.00711026	.00042417		
2	COLD TEST	79.15	73100990	.00030465	4.31217736	.10970022
3	WARM TEST	295.15	-1.00680082	.00040065	~	
4	COLD TEST	79.15	73254708	.00033417	4.34016918	.15541412
5	WARM TEST	295.15	-1.00661811	.00044093		
6	COLD TEST	79.15	73173740	.00031086	4.32939394	.05536532
7	WARM TEST	295.15	-1.00647216	.00043530		
8	COLD TEST	79.15	73075014	.00029436	4.31540101	.07770602
9	WARM TEST	295.15	-1.00646005	.00043662		
10	COLD TEST	79.15	73243967	.00033460	4.34241055	.07348052
11	WARM TEST	295.15	-1.00653784	.00041998		
12	COLD TEST	79.15	73011741	.00036222	4.30462708	.11842266
13	WARM TEST	295.15	-1.00646268	.00050231		
14	COLD TEST	79.15	73015601	.00030184	4.30610021	.17994821
15	WARM TEST	295.15	-1.00632655	∠.00050859		
16	COLD TEST	79.15	73199601	.00029777	4.33688552	.19188468
17	WARM TEST	295.15	-1.00636786	.00045439		
18	COLD TEST	79.15	73102472	.00037714	4.32095910	.06650466
19	WARM TEST	295.15	-1.00624981	.00042991		
20	COLD TEST	79.15	73109956	.00039402	4.32350979	.09425242

CH. 12 ,30.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.32318303277

NOISE POWER STABILITY (K) = .112267883398

NOISE POWER STABILITY DELTA (K) = .136519363942

 $NPS_MAX (K) = .191884684617 NPS_MIN (K) = .0553653206754$ 

# TEST DATA SHEET 10 (Sheet 7 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	Y. Trink	Baseplate Temperature (T <sub>B</sub> ) 29.0 °C	PLO No. 1
•	Signature	-	

Compo-	Channel	ν <sub>b</sub> (ν)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	V <sub>C</sub>	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
		Posi- tive		22.0	-1.065	.000633	-194.0	1723	.000431
				22.0	-1.065	.000636	-194.0	7722	.000522
		+15.13	528.7	22.0	1.064	.000656	-194.0	7741	.000534
	·			22.0	-1.064	.000634	-194.0	7719	.00050
LO	13			22.0	-1.064	.000697	-194.0	- 7722	.00050
	Š	Nega-		22.0	-1.064	.000673	-194.0	7938	.000 50
				22.D	-1.064	.000652	-194.0	-7718	.00045
		-15.i3	-64.6	22.0	-1.064	.000621	-194.0	- 7734	.00045
				22.0	1.064	.000612	-194.0	7732	.00047
				12.0	-1.064	.000583	-194.0	-7732	.00044
Mixer/ Amps	All	9.93	244.5						
IF Amps	Ail	7.94	268.6						

Part No.: 1356429-1	Test Engineer: Y. Uruh
Serial No.: Fo4	Quality Assurance: (1) (1) (268) (1) (268) (1) (268)
	Date: 1/20/99

# TEST DATA SHEET 10 (Sheet 22 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Sett	p Verified:_	Y. Vru Signa		Baseplat	e Temperatu	re (T <sub>B</sub> ) <u>29</u>	<u>°.o</u> .°C P	LO No. 1	
NF (dB)					NPS (K)				
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
13		4.31				0.139			
		4.31				0.131			
		4.34				0.057			
		4.30				0.136			
		4.31				0.166			
		4.34				0.098			
		4.31				0.076			
=		4.33				0.167			
		4.33				0.183			
		4.33				0.230			
	4.7		4.32	Pass	0.24		0.138	0.173	Pass
	·							Pass = P,	Fail = F
Part No.:_	135	6429-1			Test Engine	er:	1 Trink	, 1	
Serial No.	:	<u> 6429-1</u> Fo4			Quality Ass	urance:	AT 1	N 22 '99	
					Date:	1/2	0/99		

#### AMSU-A TEST

A1-1, S/N: F04, CH13, PLO #1, NF & NPS DATA, TB=29 C, 1/20/99

SEQ	TEMP_TEST	TEST TEMP VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15 -1.06468546	<b>~.</b> 00063308		
2	COLD TEST	79.1577234873	.00048729	4.30541200	.13901387
3	WARM TEST	295.15 ~1.06450933	.00063597		
4	COLD TEST	79.1577221963	.00052190	4.30539206	.13134396
5	WARM TEST	295.15 -1.06435001	.00065580		
6	COLD TEST	79.1577412253	.00053614	4.33568951	.05689866
7	WARM TEST	295.15 -1.06429485	.00063403		
8	COLD TEST	79.1577189784	.00050176	4.30290653	.13597329
9	WARM TEST	295.15 -1.06415580	.00069738		
10	COLD TEST	79.1577216305	.00050020	4.30838348	.16636833
11	WARM TEST	295.15 -1.06389976	.00057297		~
12	COLD TEST	79.1577382198	.00050637	4.33609516	.09805376
13	WARM TEST	295.15 -1.06392446	.00065200		
14	COLD TEST	79.1577178671	.00045514	4.30526274	.07561831
15	WARM TEST	295.15 -1.06390528	.00062070		
16	COLD TEST	79.1577336826	.00045215	4.32920272	.16671734
17	WARM TEST	295.15 -1.06379528	.00061231		
18	COLD TEST	79.1577319468	.00047425	4.32779419	.18288380
19	WARM TEST	295.15 -1.06357429	<b>~</b> .00058312	++	
20	COLD TEST	79.1577323387	.00044187	4.33080156	.22961304

CH. 13 ,15.75 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.31871495703

NOISE POWER STABILITY (K) = .138248437045

NOISE POWER STABILITY DELTA (K) = .172714378344

 $NPS_MAX(K) = .229613041511 NPS_MIN(K) = .0568986631671$ 

# TEST DATA SHEET 10 (Sheet 8 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

est Setup Verified: Y- Vrink Signature	Baseplate Temperature (T <sub>B</sub> ) <u>29.0</u> °C	PLO No. 1
--	--	-----------

Compo-	Channel	ν <sub>ν</sub> (ν)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	<u>(v)</u>	T <sub>C</sub> (°C)	٧c	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
		Posi- tive		22.0	-1.079	.00108	-194.0	7814	.000786
				£2.0	-1.079	.00111	-194.0	7829	.000722
	·	+15.13	528.7	22.0	-1.076	.00105	-194.0	-7823	.000729
			i	22.0	-1.076	.00112	-194.0	7799	.000717
LO	LO 14  Negative			22.0	-1.076	.00935	-1940	7804	.000816
				22.0	-1.076	.00107	-194.0	<b>78</b> 07	.000833
				22.0	-1.076	.000977	-194.0	7796	.00080
		-15.13	-64.6	22.0	-1.076	.00103	-194.0	-,7799	.00066
				22.0	-1.076	.00107	-1940	7303	.000808
			22.0	-1.076	.00112	194.0	7819	.00077	
Mixer/ Amps	All	9.93	244.5						
IF Amps	All	7.94	268.6						

Part No.: 1356429~1	Test Engineer: Y- Unil
Serial No.: F04	Quality Assurance: (992)  Date: 1/20/99

### TEST DATA SHEET 10 (Sheet 23 of 30)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Sett	ın Verified	7. Trink				re (T <sub>B</sub> ) 29	. C °C E	LO No. 1	
1000 000	_p	Signa	ature	Dasepia	e remperate	10 (1g)	0 1	LO NO. 1	
		NF (	dB)				NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
14	(wax)	4.31				0.122			
		4.33				0.166			
		4.33				0.220			
		4.29				0.199			
		4.30				0.408			
:		4.31				0.146			
		4.29				0.350			
		4.29				0.259			
	·	4.30				0.152			
		4.32				0.200			
	4.7		4.31	Pass	0.36		0.222	0.286	Pass
								Pass = P,	Fail = F
	12					C,	14 · A		
Part No.:_	1356	429-1 4	<del> </del>		Test Engine	er:	Ormer (892)	(~)	
Serial No.	: Fo	4			Quality Assu		AT AS Ses	MI 55 34	
					Date:	1/20	199	<u></u>	

#### AMSU-A TEST

A1-1, S/N: F04, CH14, PLO #1, NF & NPS DATA, TB=29 C, 1/20/99

SEQ	TEMP_TEST	TEST TEM	P VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.07697646	.00107684		
2	COLD TEST	79.15	78135737	.00078640	4.30677888	.12191844
3	WARM TEST	295.15	-1.07684776	.00111264		
4	COLD TEST	79.15	78287814	.00072248	4.33071624	.16564416
5	WARM TEST	295.15	-1.07647048	.00104710		
6	COLD TEST	79.15	78230248	.00072949	4.32623546	.22015901
7	WARM TEST	295.15	-1.07627659	.00112262		
8	COLD TEST	79.15	77994584	.00071675	4.29342578	.19881784
9	WARM TEST	295.15	-1.07635106			
10	COLD TEST	79.15	78042692	.00081645	4.29973077	.40766906
11	WARM TEST	295.15	-1.07616134	.00107050		
12	COLD TEST	79.15	78068973	.00083337	4.30565032	.14558910
13	WARM TEST	295.15	-1.07622153	<b>√.</b> 00097682		
14	COLD TEST	79.15	77960570	.00079974	4.28899836	.35043401
15	WARM TEST	295.15	-1.07629519	.00102932		
16	COLD TEST	79.15	77994202	.00066452	4.29317047	.25915505
17	WARM TEST	295.15	-1.07606276	.00106863		
18	COLD TEST	79.15	78030771	.00080835	4.30105843	.15223992
19	WARM TEST	295.15	-1.07618226	.00112237		
			78191554	.00077923	4.32359820	.19973398
20	COLD TEST	73.13	(6:3:334	.00017323	4.52535020	.,5315550

CH. 14 ,5.92 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.30695929943

NOISE POWER STABILITY (K) = .222136056532

NOISE POWER STABILITY DELTA (K) = .285750620816

 $NPS_MAX (K) = .407669064423 NPS_MIN (K) = .121918443607$ 

# TEST DATA SHEET 10 (Sheet 9 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	7. Trinh	Baseplate Temperature (T <sub>B</sub> ) 29.0 °C	PLO No. 2
	Signature		

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	Vc	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
	-	Posi- tive		22.0	-1.135	.000221	-194.D	8139	.00025
		+15.13	537.9	22.0	-1.134	.000245	-194.0	8163	.000260
				22.0	-1.134	.000249	-194.0	-8137	.00020
				22.0	-1.134	.000227	-194.0	-8111	.00018
LO	9	Nega- tive		22.0	-1.134	.000239	-194.D	-8126	.000213
				21.0	-1.134	.000221	-194.0	- 8135	.00022
		-1513	-70.5	22.0	1.133	.000274	-194.0	8136	.00027
				22.0	-1.133	.000245	-194.0	- 8111	.00022
				22.0	-1.133	.000147	-194.0	-8115	.00020
				21.0	-1.133	.000218	-194.0	8120	.00022
Mixer/ Amps	All	9.94	244.5						
IF Amps	All	7.94	268.1						

Part No.: 1356429-1	Test Engineer: Y. Lymb
Serial No.: F04	Quality Assurance: (7A)
	Date: 1/21/99

TEST DATA SHEET 10 (Sheet 24 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setu	p Verified:_	Y- Yrm Signa	Ature	Baseplat	e Temperatu	re (T <sub>B</sub> ) <u>29.</u>	<u>o</u> ∘C I	PLO No. 2	
		NF (	(dB)			· · · · · · · · · · · · · · · · · · ·	NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
9		4.18				0.029			
		4.21				0.067			
		4.18				0.072			
		4.15				0.020			
		4.17				0.055			
		4.18				0.029			
		4.19				0.105			
		4.15				0.065			
		4.16				0.068			
		4.17				0.036			
	4.7		4.17	Pass	.08		0.055	0.085	Pass
								Pass = P,	Fail = F
		6429-1			Test Engine	eer:	. Fruli		
Serial No	.:F	04			Quality Ass	вигапсе:	(Ar)	<del>381 66</del> .60	<u> </u>
					Date:	1/21	<del> 9</del> 9		

#### AMSU-A TEST

A1-1, S/N: F04, CH9, PLO #2, NF & NPS DATA, TB=29 C, 1/21/99

SEQ	TEMP_TEST	TEST TEMP VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15 -1.13470870	.00022092		
2	COLD TEST	79.1581389588	.00025811	4.17750956	.02906862
3	WARM TEST	295.15 -1.13433972	.00024548		
4	COLD TEST	79.1581631049	.00026005	4.21419009	.06662805
5	WARM TEST	295.15 -1.13432654	.00024943		
6	COLD TEST	79.1581368763	.00020945	4.17840761	.07247807
7	WARM TEST	295.15 -1.13375494	.00022690		
8	COLD TEST	79.1581105045	.00018926	4.14825149	.02004619
9	WARM TEST	295.15 -1.13365421	.00023924		
10	COLD TEST	79.1581263320	.00021332	4.17050774	.05490071
11	WARM TEST	295.15 -1.13356034	.00022082		
12	COLD TEST	79.1581352903	.00022643	4.18374664	.02869195
13	WARM TEST	295.15 -1.13331272	.00027355		
14	COLD TEST	79.1581363316	.00026999	4.18759973	.10529023
15	WARM TEST	295.15 -1.13329750	.00024494		
16	COLD TEST	79.1581107838	.00022508	4.15294310	.06516934
17	WARM TEST	295.15 -1.13291233	.00024672		
18	COLD TEST	79.1581146372	.00020332	4.16192513	.06838521
19	WARM TEST	295.15 -1.13270164	.00021812		
20	COLD TEST	79.1581198267	.00022223	4.17104811	.03637291

CH. 9 ,154 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.17466073354

NOISE POWER STABILITY (K) = .0547031274103

NOISE POWER STABILITY DELTA (K) = .0852440430194

 $NPS_MAX (K) = .105290231007 NPS_MIN (K) = .0200461879878$ 

### TEST DATA SHEET 10 (Sheet 10 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub> (V)		T <sub>C</sub> (°C)	V <sub>c</sub> (V)			
nent	No.	- 5(1)	<b>5</b> (,	-111	Mean	Standard Deviation		Mean	Standard Deviation		
		Posi- tive		22.0	-1.047	.000297	-194.0	7521	.000 2 2 2		
		+15.13	+15.13	537.9	22.0	-1.046	.000300	-194.0	7527	.000217	
				557.7	22.0	-1.045	.000360	-194.0	7523	.000203	
				22.0	-1.046	.000312	-194.0	7519	.00022		
LO	10	Nega- tive		22.0	-1.046	.000 296	-194.0	7505	.000 199		
		-15.13	-15.13	-16.13		22.0	-1.046	.000295	-194.0	7509	.000284
					-70.5	22.0	1.046	.000365	-194.0	7512	.000215
					22.0	-1.045	.000341 .000345 T.Tamb	-194.0	7523	.000198	
				22.0	-1.045	,000383	-194.0	7519	.000224		
				22.0	-1.045	.000327	-194.0	75i2	.000210		
Mixer/ Amps	All	9.94	244.5								
IF Amps	All	7.94	268.1								
	13564 Fo4						7. Tru	- 1			

### TEST DATA SHEET 10 (Sheet 25 of 30)

		Noise Figur	e and Noise	Power Stabil	ity Test Data	ı (Paragraph	3.5.4) (A1-1	)		
Test Set	up Verified:		Aature	Baseplat	te Temperatu	re (T <sub>B</sub> ) _29	<u>'.0</u> ℃ F	PLO No. 2		
		NF	(dB)			NPS (K)				
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail	
10		4.05				0.039				
		4.06				0.161				
i		4.06				0.081				
		4.05				0.081				
		4.06				0.058				
		4.06				0.068				
		4.07				0-129				
		4.06				0.127				
		4.05				0.051				
		4.06				0.095				
	4.7		4.06	Pass	0.12		0.089	0.122	Pass	
					<del></del>		1	Pass = P,	Fail = F	
	. ~ .	-///20				\a`	<b>-</b>			
Part No.:_	۷۵/	56429	-/		Test Enginee	r:	_		<del></del>	
Serial No.	÷	F04			Quality Assu			M 25 .36		
					Date:	1/21	1 /99			

#### AMSU-A TEST

A1-1, S/N: F04, CH10, PLO #2, NF & NPS DATA, TB=29 C, 1/21/99

SEQ	TEMP_TEST		VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1 2	WARM TEST	295.15 79.15	94099605 66695940	.00027051 .00022649	4.04808889	.03916203
3	WARM TEST COLD TEST	295.15 79.15	94106590 66764620	.00033527 .00018791	4.05827038	.16130715
5 6	WARM TEST	295.15 79.15	94141469 66777144	.00028526 .00019930	4.05631687	.08129722
7 8	WARM TEST	295.15 79.15	94116512 66724170	.00024522 .00017103	4.05068199	.08118184
9	WARM TEST	295.15 79.15	94130421 66779057	.00025562 .00025962	4.05787539	.05809652
11	WARM TEST	295.15 79.15	94145823 66781883	.00027973 .00018545	4.05658064	.06824236
13	WARM TEST COLD TEST	295.15 79.15	94128942 66823458	.00031172 .00019017	4.06514851	.12857465
15 16	WARM TEST COLD TEST	295.15 79.15	94121122 66791485	.00031087 .00018474	4.06091870	.12720478
17 18	WARM TEST COLD TEST	79.15	94111837 66723577	.00027378 .00017972	4.05111663	.05130170
19 20	WARM TEST COLD TEST	295.15 79.15	94093186 66754614	.00029205 .00017518	4.05819088	.09545233

CH. 10 ,75.9 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.05632159868

NOISE POWER STABILITY (K) = .089182058938

NOISE POWER STABILITY DELTA (K) = .122145118973

 $NPS_MAX(K) = .161307152913$   $NPS_MIN(K) = .0391620339398$ 

# TEST DATA SHEET 10 (Sheet 11 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Y. Vsinh	Baseplate Temperature (T <sub>B</sub> ) 29.0 °C	PLO No. 2
Signature		

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	v <sub>c</sub>	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
		Posi- tive		22.0	-1.047	200297	-194.0	7521	000222
		+15.13	6379	22.0	-1.046	.000300	-194.0	7527	.000 217
		115,13	דונפ	22.0	-1.045	.000360	-194.0	7523	.000203
				22.0	-1.046	.0003j3	-194.0	7519	.000221
LO	11	Nega- tive		220	-1.046	.000296	-1940	7505	.000 199
				22.0	1.046	.000295	-194D	7509	.000284
		-15.13	-70.5	22.0	1.046	:000365	-194.0	7512	.000 215
				22.0	-1.045	.000341	-194.0	-, 7523	,000198
				22.0	-1.045	.000383	-194.0	-,7519	.000224
				22.0	-1.045	.000327	-194.0	7512	.000210
Mixer/ Amps	All	9.94	244.5						
IF Amps	All	7.94	268.1						

Part No.: /356429 - /	Test Engineer: Y. Van L
Serial No.:FOY	Quality Assurance: 7A 268 22 79
	Date: 1/21/99

# TEST DATA SHEET 10 (Sheet 26 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setu	up Verified:_	Signa	ature	Baseplat	e Temperatu	re (T <sub>B</sub> )	°C P	LO No. 2	
	<del> </del>	NF (	dB/			-	NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
11	()	4.20				0.062			
		4.21				0.052			
		4.21				0.138			
		4.21				0.039			
		4.18				0.064			
		4.19				0.066			
		4.20				0.143			
		4.21				0.108			
		4.21				0.168			
		4.20				0.082			
	4.7		4.20	Pass	.12		0.092	0.129	Pass
<u> </u>								Pass = P,	Fail = F
Part No.:	/35	6429	-/		Test Engine	eer: <u>/</u>	Yruh.		
Serial No	).: <i>/</i>	FO4			Quality Ass	surance:	AT E23	NA 53 .04	
		. :			Date:		21/99		

#### AMSU-A TEST

A1-1, S/N: F04, CH11, PLO #2, NF & NPS DATA, TB=29 C, 1/21/99

SEQ	TEMP_TEST	TEST TEMP VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15 -1.04683165	.00029669		
2	COLD TEST	79.1575210394	.00022247	4.19586513	.06187184
3	WARM TEST	295.15 -1.04602228	.00030005		
4	COLD TEST	79.1575265688	.00021716	4.21273976	.05192198
5	WARM TEST	295.15 -1.04549390	.00036043		
6	COLD TEST	79.1575232031	.00020296	4.21339032	.13784180
7	WARM TEST	295.15 -1.04552831	.00031261		
8	COLD TEST	79.1575185075	.00022101	4.20602484	.03897366
9	WARM TEST	295.15 -1.04575478	.00029563		
10	COLD TEST	79.1575048636	.00019919	4.18335084	.06359486
11	WARM TEST	295.15 -1.04573561	.00029479		
12	COLD TEST	79.1575086245	.00028366	4.18912761	.06573289
13	WARM TEST	295.15 -1.04560408	.00036469		
14	COLD TEST	79.1575117549	.00021468	4.19517456	.14314074
15	WARM TEST	295.15 -1.04542043	.00034092		
15	COLD TEST	79.1575233371	.00019776	4.21437873	.10763742
17	WARM TEST	295.15 -1.04534434	.00038333		
18	COLD TEST	79.1575190489	.00022352	4.20880174	.15794882
19	WARM TEST	295.15 -1.04536337	.00032746		
20	COLD TEST	79.1575122989	.00020957	4.19855260	.08150395

CH. 11 ,69.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.20175292273

NOISE POWER STABILITY (K) = .0920267954857

NOISE POWER STABILITY DELTA (K) = .128975163975

 $NPS_MAX(K) = .167948819866 \qquad NPS_MIN(K) = .0389736558911$ 

### TEST DATA SHEET 10 (Sheet 12 of 30) e Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Compo-	Channel	V <sub>b</sub> (V)	i <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	V <sub>C</sub>	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
		Posi- tive		22.0	-1.022	.000454	-194.0	7.7326	.000316
		+15.13	537.9	22.0	-1.019	.०००५१५	-194.0	7324	.000296
				22.0	-1.018	.000432	-194.0	7310	.000340
				22.0	-1.018	.000447	-194.0	73i5	.000398
LO	12			22.D	-1.018	.000474	-194.0	7.7300	.000333
		Nega- tive		22.0	-1.017	.000432	-194.0	7312	.000324
				22.0	-1.018	.000486	-194.0	7304	.000362
		-15.13	-70.5	22.0	-1.018	.000465	-194.0	7294	.000334
				22.0	-1.018	.000454	-194.0	7314	.000319
				12.0	1.018	.000492	-194.0	7296	.000324
Mixer/ Amps	All	9.94	244.5						
IF Amps	Ali	7.94	268.1						
	1356 Fo	<i></i>	,				<b>7. 2</b>	,	

### TEST DATA SHEET 10 (Sheet 27 of 30)

		Noise Figur	e and Noise	Power Stabil	ity Test Data	a (Paragraph	3.5.4) (A1-1	)		
Test Set	up Verified:_	7. Vring Sign	ature	Basepla	te Temperati	ire (T <sub>B</sub> ) <u>29</u>	<u>.</u> 0 °C F	PLO No. 2		
		NF	(dB)		NPS (K)					
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail	
12		4.17				0.024				
		4.20				0.137				
		4.19				0.100				
		4.20				0.049				
		4.18				0.110				
		4.20				0.098				
		4.18				0.134				
		4.17				0.084				
		4.20	類素			D. 033	. 4			
		4.17	海島			D. 147				
	4.7		4.19	Pass	0.18		0.092	0.124	Pass	
								Pass = P,	Fail = F	
	~	-/ // a 9				1	112 · 4	,		
		56429	7 - /		Test Engine	er:	_	<u> </u>		
Serial No	.:	204		<del></del>	Quality Ass	urance:	Ar.	HW 22 '99	<del></del>	
ŀ					Date:		/21/99			

#### AMSU-A TEST

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A1-1, S/N: F04, CH12, PLO #2, NF & NPS DATA, TB=29 C, 1/21/99

SEQ	TEMP_TEST		OLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST		)2161365 /3256917	.00045427 .00031649	4.17438176	.02350585
2 3	WARM TEST	295.15 -1.0	73235149	.00041400	4.19840477	.13677768
4 5	COLD TEST WARM TEST	295.15 -1.0	1836082	.00043165	4.18540311	.10010049
6 7	COLD TEST		73096200 31792865	.000339 <b>50</b> .00044688	4.18340311	
8	COLD TEST		73147634 31770612	.00039815 .00047448	4.19797062	.04880153
9 10	WARM TEST		7299 <b>7</b> 558	.00033347	4.17754731	.10964528
11 12	WARM TEST		01736624 73123589	.00043206 .00032394	4.20047124	.09839411
13	WARM TEST		01769834 73 <b>0</b> 37148	.00048560 .00036248	4.18365260	.13449355
15	WARM TEST	295.15 -1.0	21783468 72939579	.00046538 .00033622	4.16734862	.08448377
16 17	COLD TEST WARM TEST	295.15 -1.0	01774182	.00045423	4.19926417	.03777182
18 19	COLD TEST		73142681 0177 <b>03</b> 57	.00031928 .00049221		
20	COLD TEST		72962024	.00032413	4.17217858	.14706104

CH. 12 ,30.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.1856787714

NOISE POWER STABILITY (K) = .0921035105212

NOISE POWER STABILITY DELTA (K) = .123555193509

NPS\_MAX (K) = .147061038766 NPS\_MIN (K) = .0235058452575

# TEST DATA SHEET 10 (Sheet 13 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	4. Trink	Baseplate Temperature (T <sub>B</sub> ) 30.0 °C	PLO No. 2
•	Signature	•	

Compo-	Channel	V <sub>b</sub> (V)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	Vc	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
	-	Posi- tive		22.D	-1.080	.000737	-194.0	7804	.00044
		+15.13		22.0	1.081	.000674	-194-0	7801	.00051.
			3 538 3	22.0	1.080	.000678	-194.0	<i>7765</i>	.00048
				22.0	1.080	.000638	-194.0	r.7757	.80047
LO	13	Nega- tive		22.0	1.080	.000663	-194.0	7753	.00046
				22.0	-1.080	.000648	-194.0	7756	.00042
•				22.0	-1.081	.000643	-194.0	7771	:000510
		-15.13	-70.6	22.0	-1.080	.000663	-194.0	7751	.00046
				22.0	1.080	.000591	-194.0	1773	.00044
				22.0	-1.080	.000657	-194.0	7761	.00045
Mixer/ Amps	All	9.94	244.6						
IF Amps	All	7.94	268.0						

Part No.:	1356 429 - 1	Test Engineer: 2 Isinh	
Serial No.:	F04	Quality Assurance:	
		Date: 1/21/99	

TEST DATA SHEET 10 (Sheet 28 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setu	ip Verified:_	7. Trie Signa	<u>h</u>	Baseplat	e Temperatu	re (T <sub>B</sub> ) <u>30.</u>	<u>o</u> °C P	LO No. 2	
		NF (	dB)				NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
13		4.26				0.222			
		4.25				O.D58			
		4.20				0.078			
		4.19				0.144			
		4.18			7.00	0.063			
		4.19				0.119			
		4.21				0.132			
:		4.18				0.064			
		4.21				0.223			
		4.20				0.087			
	4.7		4.21	Pass	0.24		0.119	0.165	Pals
								Pass = P,	Fail = F
							1 🔪 🦎	?	
Part No.:_	1356	1429-1				eer:			
Serial No.	.:F	04				surance:	_	<u>s</u>	N 82 '99
					Date:	1/2	y /99		

#### AMSU-A TEST

A1-1, S/N: F04, CH 13, PLO #2, NF &NPS DATA, TB=30C, 1/21/99

SEQ	TEMP_TEST	TEST TEM	P VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.08042737	.00073664		
2	COLD TEST	79.15	78035466	.00044056	4.25539404	.22171611
3	WARM TEST	295.15	-1.08061382	.00067411		
4	COLD TEST	79.15	78006660	.00051345	4.24924043	.05794170
5	WARM TEST	295.15	-1.08049372	.00067810		
6	COLD TEST	79.15	77648406	.00048188	4.19867376	.07782457
7	WARM TEST	295.15	-1.08045890	.00063766		
8	COLD TEST	79.15	77566790	.00047810	4.18730997	.14380464
9	WARM TEST	295.15	-1.08031592	.00066308		
10	COLD TEST	79.15	77526717	.00045960	4.18303532	.06331142
11	WARM TEST	295.15	-1.08036614	.00064753		
12	COLD TEST	79.15	77563159	.00042182	4.18774446	.11949408
13	WARM TEST	295.15	-1.08065655	.00064289		
14	COLD TEST	79.15	77710763	.00051034	4.20596401	.13245461
15	WARM TEST	295.15	-1.08021050	.00066288		
16	COLD TEST	79.15	77507786	.00046872	4.18140634	.06398658
17	WARM TEST	295.15	-1.08020954	.00059144		
18	COLD TEST	79.15	77725671	.00046360	4.21274937	.22294581
19	WARM TEST	295.15	-1.08004034	.00065749		
20	COLD TEST	79.15	77613362	.00045035	4.19831954	.08747903

CH. 13 ,15.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.20605619777

NOISE POWER STABILITY (K) = .119095865519

NOISE POWER STABILITY DELTA (K) = .165004117053

 $NPS_MAX(K) = .222945812076$   $NPS_MIN(K) = .0579416950224$ 

## TEST DATA SHEET 10 (Sheet 14 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Ve	erified:	1. Trii Signat	<u>J</u>	Baseplate Temperature (T <sub>B</sub> ) <u>30.0</u> °C PLO No. 2					
Compo- nent	Channel No.	V <sub>b</sub> (V)	i <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub> (V)	T <sub>C</sub> (°C)	Vc	(V)	

Compo-	Channel	<b>V</b> <sub>b</sub> ( <b>V</b> )	i <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	Vc	
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
_		Posi- tive		22.0	-1.095	.000956	-194.0	7876	.000 784
				22.0	-1.095	.001152	-194.0	- 1813	.000735
		+15.13	538.3	22.0	-1.094	.001078	-194.0	-7866	.00073
				22.0	-1.094	.001120	-194.0	7846	.00075
LO	14			22.0	-1.094	.001110	-194.0	7861	.00080
	į	Nega- tive		22.0	-1.094	.001099	194.0	7845	.00083
				22.0	-1.094	.001185	-194.0	7858	.00066
		-15.13	-70.6	22.0	-1.094	.001073	-194.D	7857	.00076
				22.0	-1.093	.000910	-194.0	7835	.00071
				22.0	-1.093	.001132	-194.0	7853	.00079
Mixer/ Amps	All	9.94	244.6						
IF Amps	Ali	7.94	268.0						

Part No.:	1356429-1	Test Engineer: Y Ysils
Serial No.:_	F04	Quality Assurance:
		Date: 1/21/99

### TEST DATA SHEET 10 (Sheet 29 of 30) nd Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Set	up Verified:	4.4	ruls ature		te Temperatu		···-	PLO No. 2	
		NF	(dB)				NPS (K)		<u> </u>
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
14		4.21				0.393			
		4.21				0.222			
		4.20				0.178			
		4.18				0.121			
		4.20				0.062			
		4.18				0.087			
		4.20				0.247			
		4.20				0.190			
		4.17				0.439			
		4.20				0.169			
	4.7		4.19	Pass	0.36		0.216	0.377	Pass
								Pass = P,	Fail = F
Doet No.	/2	C	-/		Test Engine	- Y	Buch		
Serial No.	: <i>F</i>	56429 Fo4			Quality Assu		^	Ø de	
					Date:		$\sim$		

### AMBU-A TEST

AI-1, S/N: FOR, CH 1K, PLO #2, NF & NPS DATA, TB=30°C, 1/21/99

SEQ	TEMP_TEST	TEST TEMP	○ VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.09458405	.00095603	4 21741475	.39343855
2	COLD TEST	79.15	78764650	.00078403	4.21341475	.,,,,,,,,,,
3	WARM TEST	295.15	-1.09487371	.00115216		22275520
4	COLD TEST	79.15	78730380	.00073492	4.20557327	.22235529
5	WARM TEST	295.15	-1.09434013	.00107796		
6	COLD TEST	79.15	78659626	.00073863	4.20096971	.17761434
7	WARM TEST	295.15	-1.09366300	.00112012		
8	COLD TEST	79.15	78461970	.00075517	4.17984038	.12139468
9	WARM TEST	295.15	-1.09376118	.00111017		
10	COLD TEST	79.15	78613388	.00080828	4.20031243	.06184138
11	WARM TEST	295.15	-1.09352156	.00109937		
12	COLD TEST	79.15	78454235	.00083771	4.18018180	.08727032
13	WARM TEST		-1.09369559	.00118474		
14	COLD TEST	79.15	78577271	.00066491	4.19585128	.29680980
15	WARM TEST		-1.09365015	.00107279		
16	COLD TEST		78573639	.00076487	4.19579913	.19030858
17	WARM TEST		-1.09334391	.00090979		
18	COLD TEST		78354152	.00071752	4.16783784	.43879324
19	WARM TEST		-1.09291719	.00113165		
20	COLD TEST		78527770	.00077566	4.19676407	.16879106
7.10	- COLO 1621	, , , , ,	• • • • • •			

CH. 14 ,5.92 MHz MHz

NOISE FIG AVERAGE (dB) = 4.19367389253

NOISE POWER STABILITY (K) = .215861724956

NOISE POWER STABILITY DELTA (K) = .376951858241

 $NPS_MAX(K) = .438793240857$   $NPS_MIN(K) = .0618413826159$ 

INTEGRATION TIME = .165

HIT CONTINUE KEY OR TYPE 'CONT'

TEST DATA SHEET 10 (Sheet 15 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:_	7. Vinh	Baseplate Temperature (T <sub>B</sub> )	29.0	_°C
-	Signature			

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	V <sub>c</sub>	; (V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
				22.0	-9402	2000872	-194.0	-7693	.0000470
				22.0	-9396	.0000857	-194.0	-7668	.0000733
				22.0	-19394	.0000900	-194.0	7667	.0000682
				22.0	-9394	2000851	-194.0	7665	.0000614
LO	LO 15 14.88 184	184.1	22.D	-9392	.0000855	-194.0	7665	.0000787	
				22.0	-9391	.0000797	-194.0	-7665	.000066
				22.0	-19391	-0000101	-194.0	7665	.000069
				22.0	-9391	.0000750	-194.0	7665	.0000108
				22.0	-9391	.0000103	-194.0	-7668	.0000912
				22.0	-9393	.0000871	-194.0	-7660	.000923
Mixer/ Amps	All	9.94	244.5						
IF Amps	All	7.94	268.1						

Part No.: /356429-/	Test Engineer: Y. Yrinh
Serial No.: Fo 4	Quality Assurance: (268) . W 22 '99
	Date: 1/19/99

# TEST DATA SHEET 10 (Sheet 30 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Sett	p Verified:_	Y. Yrul Signa	ature	Baseplate	e Temperatu	re (T <sub>B</sub> ) <u>29.</u>	<u></u> <b>©</b> •℃		
					NDC (K)				
Channel No.	Required (Max)	NF (	ав) Average	Pass/Fail	Required (Max)	Measured	NPS (K) Average	Delta	Pass/Fail
15	(mea)	6.05				0.058			
		6.06				0.054			
		6.06				0.065			
		6.05				0.053			
		6.06				0.054			
		6.06				0.038			
		6.06				0.086			
		6.06				0.017			
		6.07				0.090			
		6.06				0.058			
	9.05		6.06	Pass	0.15		0.057	0.073	Pass
								Pass = P,	Fail = F
Davi Ma	/20	C6429	-/		Tost Ei		7.11		
Serial No.:	.:/	56429 Fo4			Test Engine Quality Ass	urance:	268	MH 55 .34	
					Date:	i/19	/99		
									<del></del>

#### AMSU-A TEST

A1-1, S/N: F04, CH15, NF & NPS DATA, TB=29 C, 1/19/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	94024146	.00008720		
2	COLD TEST	79.15	76727692	.00006697	6.05429065	.05802968
3	WARM TEST	295.15	93956458	.00008565		
4	COLD TEST	79.15	76683318	.00007331	6.05703274	.05449619
5	WARM TEST	295.15	93943028	.00009001		
6	COLD TEST	79.15	76665069	.00006819	6.05519256	.06455285
7	WARM TEST	295.15	93943524	.00008513		
8	COLD TEST	79.15	76654092	.00006137	6.05231999	.05316478
9	WARM TEST	295.15	93922374	.00008551		
10	COLD TEST	79.15	76651938	.00007879	6.05613310	.05421678
11	WARM TEST	295.15	93913816	.00007970		
12	COLD TEST	79.15	76649036	.00006690	6.05716426	.03793917
13	WARM TEST	295.15	93906146	.00010052		
14	COLD TEST	79.15	76648257	.00006901	6.05854954	.08555734
15	WARM TEST	295.15	93906817	.00007499		
16	COLD TEST	79.15	76649573	.00010839	6.05874381	.01736258
17	WARM TEST	295.15	93912209	.00010299		
18	COLD TEST	79.15	76678864	.00009122	6.06503926	.09016081
19	WARM TEST	295.15	93931148	.00008713		
20	COLD TEST	79.15	76660153	.00009248	6.05639927	.05808662

CH. 15 ,984 MHz MHz

NOISE FIGURE AVERAGE (dB) = 6.0570877119

NOISE POWER STABILITY (K) = .0573566802912

NOISE POWER STABILITY DELTA (K) = .0727982275804

 $NPS_MAX(K) = .0901608119468$   $NPS_MIN(K) = .0173625843665$ 

TB 57

TB 53

### **TEST DATA SHEET 16** Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A1-1)

Test Setup Verified: 7. 2 Baseplate Temperature (T <sub>B</sub> ) 23 °C  Signature								
Reference Designation	Specification	Measured Value	Pass/Fail					
RT 40	2200 ± 100 Ω	2/7/ Ω	P					
RT 45	2200 ± 100 Ω	2169 Ω	P					
RT 11	2200 ± 100 Ω	2/68 Ω	P					
RT 13	2200 ± 100 Ω	2/69 Ω	P					
RT 15	2200 ± 100 Ω	2/69 Ω	ρ					
RT 14	2200 ± 100 Ω	2/68 Ω	P					
RT 20	2200 ± 100 Ω	2/67 Ω	P					
RT 21	2200 ± 100 Ω	2/68 Ω	P					
RT 23	2200 ± 100 Ω	2167 Ω	P					
RT 24	2200 ± 100 Ω	2169 Ω	P					
RT 25	2200 ± 100 Ω	2/69 Ω	P					
RT 26	2200 ± 100 Ω	2/68 Ω	P					
RT 27	2200 ± 100 Ω	2/7/ Ω	P					
RT 28	2200 ± 100 Ω	2/68 Ω	ρ					
RT 29	2200 ± 100 Ω	2166 Ω	ρ					
RT 30	2200 ± 100 Ω	2/66 Ω	P					
RT 31	2200 ± 100 Ω	2/67 Ω	P					
RT 34	2200 ± 100 Ω	2/70 Ω	ρ					
TB 56	3000 ± 100 Ω	3004 Ω	P					

Pass = P, Fail = F

Ω ٧

3012

4,34

Part No.: /35	Test Engineer:  Quality Assurance:  Date: ///8/99

 $3000\pm100\,\Omega$ 

4.1 - 4.6 V

#### TEST DATA SHEET 19

Survival Heater and Thermal Switch Test Data (Paragraph 3.6.2) (A1-1)

Test Setup Verified:_	7, 2ruy Signature	Baseplate Temperature $(T_B)$ $23$ $^{\circ}C$
-----------------------	----------------------	--

	Open S	witch	Closed Switch					
Reference Designation	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail			
HR1/TS1	71041	P		31.21	P			
	>10ML	P	25 - 35 Ω	32.6 r	. p			
HR2/TS2	>10MR	P		31.32	P			
	>10M1	P		31,21	P			

Pass = P, Fail = F

Part No.: 1356429-1	Test Engineer: Thirty
Serial No.: Fo 4	Quality Assurance: 266 99
	Date: 1/18/99

## TEST DATA SHEET 22 (Sheet 1 of 3) Bias Voltage Verification Test Data (Paragraph 3.6.3) (A1-1)

Test Setup Verified:	7. Isrus Signature	Baseplate Temperature (T <sub>B</sub> ) <u>23</u> °C
----------------------	-----------------------	--

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 6, 7, 15, 9-14	+10 ±0.1	9,92	P
DRO Ch 7	+10 ±0.1	9,93	P
DRO Ch 15	+15 ±0.15	14,87	P
PLO +15	+15 ±0.15	15.08	ρ
PLO -15	-15 ±0.15	-15.14	P
IF AMP Ch 9-14	+8 ±0.08	7, 93	ρ
DRO Ch 6	+10 ±0.1	9,94	P

Part No.: 1356429-1 Test Engineer: 7/12/268

Serial No.: F04 Quality Assurance: 99

Date: 1/18/99

### 7.0 ASSEMBLY INSTALLATION AND REPLACEMENT LOG

The assembly installation and replacement for this receiver subsystem are logged in the following pages.

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GENCORP	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.L)				
AEROJET	PART DESCRIPTION RECEIVER ASSEMBLY (A1-2)		1356409-1	1	6
PLANNED BY B. MULLIGAN	6/10/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	00 00	

# ASSEMBLY INSTALLATION AND REPLACEMENT LOG

ſ			INITI		REPLACEMENT						
,[	ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSF
/[	17	1356680-1	В	ISOLATOR, CH 3	00 8	( 1 4 / 2 / 2 / 2 / 2 / 2 / 2 / 2 / 2 / 2 /	7 <u>A</u> 228				
	18	1356680-2	В	ISOLATOR, CH 4	009	145 24 GZ	\$58 124	B	1/	11/5/98	7 <u>4</u> 228 98-98
	19	1356680-3	В	ISOLATOR, CH 5	106	MFG 1145 2 1 4 A	24 28 24				
	20	1356680-6	В	ISOLATOR, CH 8	06	MFG 145	7A 228			4.6	
	22	1331507-1	G	MULTIPLEXER	4	2501	6	6	5 300		(28) (28)
	23	1331509-1	G	WAVEGUIDE ATTENUATOR	104	100 S	7/A 228	2			(2-0.
	24	1331509-2	G	WAVEGUIDE ATTENUATOR	105	8.24.90	, 28 288				
	25	1331509-3	E	WAVEGUIDE ATTENUATOR	107 +05	8 24 98	(12) (12)				
	26	1331509-6	G	-WAVEGUIDE ATTENUATOR	102	1150	7A 228				
	28	1336610-3	F	STABLE OSCILLATOR	85093	8-24 AV	7A 228				
	29	1336610-4	F	STABLE OSCILLATOR	85042	MAFE (MAFE)	7A 228	F	85044	1/5/98	(3) (2) (3) (3) (4)
	30	1336610-5	F	STABLE OSCILLATOR	85032	MF 6 1145 - 96	7A 228				

#### NOTES:

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S)
  HAVE BEEN REMOVED AND
  REPLACED MORE THAN ONCE,
  RECORD THE REPLACEMENT PAR
  NUMBER AT THE END OF THE
  ASSEMBLY LOG.

GENCORP	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.L)					OF
AEROJET	PART DESCRIPTION RECEIVER ASSEMBLY (A1-2)			1356409-1	2	6
PLANNED BY B. MULLIGAN		6/10/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	00	

# ASSEMBLY INSTALLATION AND REPLACEMENT LOG

				REPLACE	MENT					
ITEM	PART NUMBER	REV	AL INSTALLATION DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INS
NO. 31	1336610-8	F	STABLE OSCILLATOR	85018	S THE S	(288) (288)				
37	1331562-13	G	MIXER/AMP CH 3	TA33	8/145/ 1/45/	(258) 274				7
38	1331562-14	G	MIXER/AMP CH 4	7A34/ TA34/ Le Thai	8-24-9 B	72. 22.8 23.8	6	7A44	11/5/98	
39	1331562-15	G	MIXER/AMP CH 5	7A35 7A34	MFG) 145	(\$\frac{\fir}\fin}}{\finitita}}}}}}}}}{\frac{\frac{\frac{\frac{\frac{\fir}{\finitita}{\finitita}}}}}}}}}{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\fir}{\fir}}}}}}{\frac{\frac{\frac{\frac{\frac{\frac}{\firin}}}}{\frac{\frac{\frac{\fir}{\fir}}}}}}{\frac{\frac				
40	1331562-18	G	MIXER/AMP CH 8	7A28	(MF 2)	A SE				
86	1331559-2	E	FILTER, IF BAND PASS	P228	145 A	(\$28)				ļ
87	1331559-3	E	FILTER, IF BAND PASS	P229-	8-24 TY	्रेट्स १२३७ <b>र</b>	}			
88	1331559-4	E	FILTER, IF BAND PASS	P230	8.24 mg G 1145	SSB				
89	1331559-5	E	FILTER, IF BAND PASS	P231	ME3	74 CS 20 7				
	·									-
				·						-
			-							<u>. </u>

#### NOTES:

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S)
  HAVE BEEN REMOVED AND
  REPLACED MORE THAN ONCE,
  RECORD THE REPLACEMENT PAR
  NUMBER AT THE END OF THE
  ASSEMBLY LOG.

GENCORP	MANUFACT	URING ASSEMBLY I	NSTRUCT	IONS (M.A.L)	PAGE	O
AEROJET	PART DESCRIPTION RECEIVER	ASSEMBLY (A1-2)		PARTNUMBER 1356409-1	3	ŧ
B. MULLIGAN		6/10/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	OP 00	

		INITIA	L INSTALLATION	1			REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	IV.
NO.	HOMBER	<del> </del>							<u>                                     </u>	$\vdash$
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										_
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							7 · ·	(		<u> </u>
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- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- IF A COMPONENT(S) OR PART(S)
   ARE REMOVED AND REPLACED,
   RECORD THE REPLACEMENT
   PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART( HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE RECORD THE REPLACEMENT NUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.L)					OF
AEROJET	PART DESCRIPTION RECEIVER ASSEM	1BLY (A1-2)	PART NUMBER 1356409-1	4	6	
B. MULLIGAN	DATE	6/10/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1		)04

		INITIA	LINSTALLATION					EMENT		
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	IN:
						٠				
										<u> </u>
										iλ
							:			
					ļ					<u> </u>
	<u> </u>	1		<u> </u>			<u> </u>	<u> </u>	<u> </u>	Т—

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S) HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT P. NUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP	MANUFACT	PAGE	OF			
AEROJET	PART DESCRIPTION RECEIVER	ASSEMBLY (A1-2)	PART NUMBER 1356409-1	5	6	
PLANNED BY B. MULLIGAN		6/10/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	OP1	

### ASSEMBLY INSTALLATION AND REPLACEMENT LOG TEMPERATURE SENSORS & THERMISTORS

S E N		INITIAL TALLAT		REF	PLACEM	ENT	S E N	INITIAL	. INSTAL	LATION	REP	LACEME	=N
S O R	S/N	MFG	INSP	S/N	MFG	INSP	S O R	S/N	MFG	INSP	S/N	MFG	11
RT12	1256	( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	72/228				TB54	201	-10-1-98 14-5 14-5		£		
RT17	1253	400	(KSS)				TB58	F88	10-1-98 11:5	, . (2,4)	9		
RT18	1254	MF 5	(X &				TB59	F74	MFG 145) 10=1-91	(2/8) (2/8)			
RT19	1261	(0-1-98  MFG  145 )	SSS	c								_	
RT22	1282	MFG ) 145 ) 10-1-91	74						-				
RT33	1259	MF G 145 0-1-9	74.50						<i>``</i>				
RT41	1258	MFG 1145 101-98	7A 228										
RT42	1283	MFG 145	74 22										
RT43	1285	MFG 145 10-1-98	7A 228	<b>.</b> .									
RT44	1284	[MFG] 145	7A 222										_
		·										<u> </u>	
													1
												`	

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S) I BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER A THE END OF THE ASSEMBLY LOC

GENCORP	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.L)					OF
AEROJET	PART DESCRIPTION RECEIVER	ASSEMBLY (A1-2)	PART NUMBER 1356409-1	6	6	
PLANNED BY B. MULLIGAN	1	6/10/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	000	

# ASSEMBLY INSTALLATION AND REPLACEMENT LOG IF ATTENUATORS

				1.550	DICE	YZATIYE	S/N	MFG	INSP
ATTEN- UATOR	REF MODULE	VALUE	S/N	MFG	INSP	VALUE	DITA	1411 (	11.01
A18	A5	4 dB	1014	7. Yru 12/22/5	8 228 8 228				
A19	A9	8dB	040	4. 2rm 12/22/	228 228	0 -/			
A20	A13	8 dB	035	4. Vr.	A 7A 228	7 X			
A21	A17	5dB	053	12/22/	17A 17A	Š			
							-		
			-						
				-					

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
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- 3. IF A COMPONENT(S) OR PART(S) E BEEN REMOVED AND REPLACED THAN ONCE, RECORD THE REPLACEMENT PART NUMBER A' END OF THE ASSEMBLY LOG.

604.

GENCORP	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)					
AEROJET	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)	PART NUMBER 1356429-1	1	6		
B. MULLIGAN	7/17/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	OO(		

# ASSEMBLY INSTALLATION AND REPLACEMENT LOG

		INIT	IAL INSTALLATIO	N				REPLA	CEMENT	
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INS
9	1356680-4	В	ISOLATOR, CHAN 6	05	8-16-98	7A 228				
10	1356680-5	В	ISOLATOR, CHAN 7	12	9-29-98					
11	1356680-7	В	ISOLATOR, CHAN 9-14	08	8-10-98	7,2				
12	1356680-8	B	ISOLATOR, CHAN 15	11	8-10-92	7A \ 228,				
14	1331509-4	G	WAVEGUIDE ATTENUATOR	103	8-4-98					
15	1331509-5	B	WAVEGUIDE ATTENUATOR	103	8-17-48	(228)				
16	1331509-7	111	WAVEGUIDE ATTENUATOR	107	1113198	(2) (3)				
17	1331509-8		WAVEGUIDE ATTENUATOR							
18	1331509-9	E	WAVEGUIDE ATTENUATOR	104	8-4-98	7A 228				-
19	1331510-1	E	WAVEGUIDE A-1 (CHAN 9)	103	(3)	333 / 42/				
20	1336610-6	F	STABLE OSCILLATOR (A39)	85027	8-4-98	A7 (852)				-
21	1336610-7	F	STABLE OSCILLATOR (A34)	85020	8-17-98	7A 223				

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
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- IF A COMPONENT(S) OR PART(S)
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   REPLACED MORE THAN ONCE,
   RECORD THE REPLACEMENT PA
   NUMBER AT THE END OF THE
   ASSEMBLY LOG.

GENCORP	MANUFACT	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)					
AEROJET	PART DESCRIPTION RECEIVER	ASSEMBLY (A1-1)		PART NUMBER 1356429-1	2	6	
PLANNED BY B. MULLIGAN		7/17/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	00 00	er 04	

		AL INSTALLATION	]				REPLAC	EMENT		
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INS
22	1336610-10	E	STABLE OSCILLATOR (A29)	FM5	8-4-48	24 228				
23	1356669-1	B	POWER DIVIDER, 3 WAY	P234 08	8.2698	?23 ?23				
25	1331546-1	G	MULTIPLEXER	04	8-10-48	7A 228				
26	1348360- <b>1</b>	P	PLO ASSEMBLY AGT (AGS) A GG	F06	10.28.91	7 <u>4</u>	P	F09	4/31/48 35	(2/2) (2/2) (2/2)
26	1348360- <b>+</b>	7	PLO ASSEMBLY	FIO	11/13/98 (75) (T)	74				
27	1331554-1	F	HYBRID TEE (A63)	03	127.58	, (X 3)				
31	1331562-16	G	MIXER/AMP CHAN 6	7A36	8-13-97	74	6	7 <del>847</del>	9-29-98 35	24
32	1331562-17	G	MIXER/AMP CHAN 7	7A3 <b>9</b>	3-14-98	228	G	7A47	9-29-73	ر ۲
33	1331562-19	G	MIXER/AMP CHAN 9-14	7A 39	12-7-97	7A 228				
34	1331562-20	G	MIXER/AMP CHAN 15 (A25)	7A40	8-10-48		1	-		
35	1331576-1	C	SAW FILTER	B03	8.26 A	7A 229				
36	1331576-2	C	SAW FILTER	B03	8-26-98 (95)	(3) (23)				

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S)
  ARE REMOVED AND REPLACED,
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  PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S)
  HAVE BEEN REMOVED AND
  REPLACED MORE THAN ONCE,
  RECORD THE REPLACEMENT PAR
  NUMBER AT THE END OF THE
  ASSEMBLY LOG.

GENCORP	MANUFACTURING ASSEMBL	PAGE	OF		
AEROJET	PART DESCRIPTION RECEIVER ASSEMBLY (A1-	-1)	PART NUMBER 1356429-1	3	6
B. MULLIGAN	DATE 7/17/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	OP1	

		INITIA	L INSTALLATIO	N			REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSF
37	1331576-3	C	SAW FILTER	B06	8-2698	828 828				
38	1331576-4	C	SAW FILTER	B07	8-21-48	(225)				
39	1356670-1	C	POWER DIVIDER 4-WAY	P235 07	8-27-48	\$ 85° P				
40	1331579-7	G	AMPLIFIER, IF	111	8-26-98 (95)	(F) (				
41	1331579-8	F	AMPLIFIER, IF	105	8-26-98	\$5.8 \$7.7				
42	1331579-9	G	AMPLIFIER, IF	111	8-26-48	335 ) 200 )				
43	1331579-10	F	AMPLIFIER, IF	105	8-21-90 95	(28g)				
44	1331579-11	G	AMPLIFIER, IF	]1[	8-26-48	\$58 2				·
45	1331579-12	F	AMPLIFIER, IF	105	8.2698 T	248				
46	1331579-13	G	AMPLIFIER, IF	11 (	8-26-98	(N) (N)				
54	1331559-2	E	FILTER, I.F. BAND PASS	007	12/1/98					
54				005		\$58 \$7				
55	1331559-1	E	FILTER, I.F. BAND PASS	008	(2/1/98	(23)				

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S) HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PAINUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP	MANUFACTURING ASSEMBLY I	PAGE	OF		
AEROJET	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)		PART NUMBER 1356429-1	4	6
B. MULLIGAN	7/17/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	00°	

r	INITIAL INSTALLATION								EMENT	
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSI
56	1331559-7	EI	FILTER, I.F. BAND PASS	<i>००५</i>	12-3-11 (2-5) T	A5 3				
57	1331559-4	E	FILTER, I.F. BAND PASS	013	/2/3/97 (35)	No.				
160	1357410-1	NA		NA	NA					
95	13315091	þ	WAVEGUIDE ATTENUATOR	103	10-28-9	100 Par 45 Par 4				
						Ì				
									<u> </u>	

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S)
  HAVE BEEN REMOVED AND
  REPLACED MORE THAN ONCE.
  RECORD THE REPLACEMENT PAF
  NUMBER AT THE END OF THE
  ASSEMBLY LOG.

GENCORP	MANUFACT	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)				OF
AEROJET	PART DESCRIPTION RECEIVER	ASSEMBLY (A1-1)	)	PART NUMBER 1356429-1	5	6
PLANNED BY B. MULLIGAN	-	7/17/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	орг 000	

### ASSEMBLY INSTALLATION AND REPLACEMENT LOG TEMPERATURE SENSORS & THERMISTORS

S E		INITIAI TALLAT		DEI	PLACEM	ENT	S E	INITIA	L INSTAL	LATION	DED	LACEMI	
N			1014	KEI	LACEIVI	ENI	N				REF	LACENII	EIN I
S O R	S/N	MFG	INSP	S/N	MFG	INSP	S O R	S/N	MFG	INSP	S/N	MFG	IN:
RT11	1244						RT28	1245			-		
RT13	1344						RT29	1240					
RT14	1244						RT30	1262			ų		
RT15	1255						RT31	1247			:		
RT20	1266						RT34	1257					
RT21	1249						RT40	1350					
RT23	1243						RT45	1267	-				
RT24	1244												
RT25	1243						TB53	141	1.499	(A) (A) (A) (A) (A) (A) (A) (A) (A) (A)			
RT26	1265						TB56	F3C	45	Sylven St.			
RT27	1271						TB57	F29	1-4-44 35 7	(388)	-		
NOTE													

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S)
  ARE REMOVED AND REPLACED,
  RECORD THE REPLACEMENT
  PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S) HAR BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP	MANUFACTURING ASSEMBLY I	ONS (M.A.I.)	PAGE	OF	
AEROJET	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)		PART NUMBER 1356429-1	6	6
PLANNED BY B. MULLIGAN	DATE 7/17/98	REVISION 01	NEXT ASSEMBLY 1331720-2/1356008-1	о <u>г</u> 00	

# ASSEMBLY INSTALLATION AND REPLACEMENT LOG IF ATTENUATORS

ATTEN- UATOR	ON MODULE	VALUE	S/N	MFG	INSP	VALUE	S/N	MFG	INSP	
A26	A25 C#15	- 4	001	2-1-99 Hutt Aller	953 953					
A32	A31	-16	0 42							
A37	A36 CH6	-16	051							
A47	A46 CH 9	-10	025		2.9					
A50	A49 CH 10	-10	014		10,					
A53	A52	-14	003							
A56	A55	-14	004							
A59	A58	-12	008	V						
A62	A61	-12	021	Late of the second	922					

- 1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
- 2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
- 3. IF A COMPONENT(S) OR PART(S) BEEN REMOVED AND REPLACE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER END OF THE ASSEMBLY LOG.

ADVANCE REL. **AEROJET, AZUSA OPERATIONS** 3. CONTRACT NUMBER CAGE Code 70143 Azusa, California CENTURP JRP AFIROJET

ENGINEERING CHANGE NC I'CE

INCORPORATE

(ADD) ENGINEERING DATH ONLY AT THE AMPLIFIER LEVEL. REGINEMIT AT THE MINKEL TO CAB/OC FROM -200 TO ENCYCES MINER/IFAMP TO BE UTILIZED TO DETERMINE COMPLIANCE WITH PARYSRAW 3.2, 1.15.2 GAIL) VERSUS OPERATING VOLTAGE... PRODUCT SPECIFICATION MODIFY s. DOCUMENT NUMBER  $A\underline{\mathcal{L}} \cdot 24867$ ON ORDER INSTALLED IN STOCK 6/25/98 R. KAPPER/10-27-97/1107 CORRUCTION REASON FOR CHANGE ACTION FOR PREVIOUS END ITEM S/N
PART SERIAL/LOT 10500 16. REMARKS/SPECIAL INSTRUCTIONS/TECHNICAL EVALUATION かられていいいかにかいると MAND LTST 3.2.1.15.1 GAIN VERSUS TENPERATURE ... **NEW REV** PART NUMBER(S) MAND LTST SONPE NAS 5-32314 3,2,1,15, 1.1/23/11 ,5/82/0/ DATE HARDWARE SOFTWARE DOC CHG CAMSU- 1352 MO ENDS Howard for B. MILLIA 12. DESCRIPTION OF CHANGE ITEM ZONE とのことのと YES (NO) 8. MULTIPLE DOCUMENTS 13. SIGNATURES Urgent X Routine 7. CHANGE CLASS IA (IB) II Design Veril., Dwg. COMBINED Systems Eng PTt. (Eng) NASA T.O.

Roberthan

DISAPPROVE

A 0 3

11/12/97 DATE: /

Design Vent., Specs. ( ... / ...

(ADD) ENGINEERING DATA ONLY AT THE AMPLIFIER LEVEL. REQUIREMENT AT THE MIXER/AMPLEVEL IS ,02 dB/°C FROM -2°C TO +38°C. BALANCED MIXER/IFAMP SHELL OF 2 ENGINEERING CHANGE NOTICE TO BE UTILIZED TO DETERMINE COMPLIANCE WITH PARAGRAPH 13.2.1.15.2 GAIN VERSUS OPERATING VOLTAGE...
(ADD) ENGNEERING DATA ONLY AT THE AMPLIFIER LEVEZ. TEST DATA PRODUCT SPECIFICATION, AE-24869 21 SHOOPPORATION 16. DISPOSITION OF UNTERAL INCORPORATE DETALED. M STOCK RMASTERS R. KAPPER/10-27-97/1107 CORRECTIVE ACTION FOR PREVIOUS SOAAS ADVANCE REL SHOTTEN SIN 105aup DISAPPROVE DEFER C. PREPARED BY / DATE / EXT No TELANCIAL IMPACT 3.2.1.15.1 GAIN VERSUS TEMPERATURE .. MAND LTST Aob MANO LTST AEROJET, AZUSA OPERATIONS ONTE 115192 NAS 5-32314 3,21.15. CAGE Code 70143 PART MAMBER(S) Azusa, California 2 () E CHG TYPE CAMSU 1352 12, DESCRIPTION OF CHANGE ITEM ZONE NA ROK Salkooor ă S L ALLIPLE DOCUMENTS 13. SECHATIONES MENCORP Unpart X Ronding 1. PROGRAM
COMBINED

### **DOCUMENT APPROVAL SHEET**



TITLE			DOCUMENT NO	J.
Performance Verification Report			Report 1141	3
METSAT (S/N: 107) AMSU-A1 Rec	eiver Assemblies, F	P/N 1356429-1,	February 19	
S/N: F04 and P/N 1356409-1, S/N:	F04		Columny 19.	33
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INPUT FROM: D. Pines	CDRL: 208	SPECIFICATION ENGINEER:		DATE
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CHECKED BY:	DATE	JOB NUMBER:		DATE
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APPROVED SIGNATURES		I IN/A	DEPT. NO.	DATE
			BEI I. NO.	DATE
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Product Team Leader (D. Pines)	( ) ano B	1 Pinas	8661	3/1/99
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Systems Engineer (R. Platt)/	Mes 10 1 de	Ø	8341	3/9/99
<u></u>				
Design Assurance (E. Lorenz)	Joen ,		8331	3/2/99
	^			
Quality Assurance (R. Taylor)	RM Tuylun		7004	4/9/99
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By my signature, I certify the above document has requirements related to my area of responsibility.	been reviewed by me and	d concurs with the technical		
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National Aeronautics and Space Administration  Report Documentation Page							
1. Report No. 2	Government Accession I	No.	3. Recipient's Catalog	No.			
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Title and Subtitle			5. Report Date				
Integrated Advanced Mici	rowave Sounding (	Jnit-A	February	1999			
(AMSU-A), Performance			6. Performing Organiza	tion Code			
7. Author(s)			8. Performing Organiza	tion Report No.			
D. Pines			11413	<del></del>			
O. Rodomina Organization Name and A			10. Work Unit No.				
<ol> <li>Performing Organization Name and A Aerojet</li> </ol>	Address		11. Contract or Grant N				
1100 W. Hol	lyvale		ľ	5-32314			
Azusa, CA 9			13. Type of Report and	Period Covered			
12. Sponsoring Agency Name and Address	ess		Final				
NASA Goddard Sp	ace Flight Center		14. Sponsoring Agency	Code			
	Maryland 20771						
This is the Performance Ve Assemblies, P/N 1356429- Advanced Microwave Sour	1, S/N: F04, P/N 1	356409-1,	5/N: 107) AMSU-A S/N: F04, for the I	n1 Receiver Integrated			
17. Key Words (Suggested by Author(s))  18. Distribution Statement							
EOS		Unclassified Un	limited				
Microwave System	m						
19. Security Classif. (of this report)	20. Security Classif. (of the	nis page)	21. No. of pages	22. Price			
Unclassified	Unclassified	,	,-3				

NASA FAR SUPPLEMENT

### PREPARATION OF THE REPORT DOCUMENTATION PAGE

The last page of a report facing the third cover is the Report Documentation Page, RDP. Information presented on this page is used in announcing and cataloging reports as well as preparing the cover and title page. Thus, it is important that the information be correct. Instructions for filing in each block of the form are as follows:

- Block 1. Report No. NASA report series number, if preassigned.
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- Block 10. <u>Work Unit No.</u> Provide Research and Technology Objectives and Plants (RTOP) number.
- Block 11. Contract or Grant No. Provide when applicable.
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- elsewhere: affiliation of authors if additional space is required for Block 9, notice of work sponsored by another agency, monitor of contract, information about supplements (file, data tapes, etc.) meeting site and date for presented papers, journal to which an article has been submitted, note of a report made from a thesis, appendix by author other than shown in Block 7.
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- Block 17. Key Words. Identifying words or phrases to be used in cataloging the report.
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**AEROJET, Azusa Operations** 

12. DESCRIPTION OF CHANGE (CONTINUED)

# ENGINEERING CHANGE NOTICE

SHEET OF C 6. REV.

5. DOCUMENT NUMBER AE-24867

CAMSU-1352 2. ECN NUMBER

**Continuation Sheet** 

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1 885 966 JUN-38-98 85:47 PM Spacekilabalina. マドばく REASET ELECTROSYSTEMS COMPANY 14 Jan. 641 PPLIER'S DISCREPANCY ACTION REQUEST IS COMPLETED BY SUPPLIED (Flower Trees or Print) THE SUPPLIED ACCOUNT FOR ALCOHOLD BY SUPPLIED AND THE SUPPLIED ACCOUNTS FOR ACCOUNTS OF MINISTERIOR LEGISLATION. 5 WHIT CHIEF HE - 1 1 A WAS 45 101 4. SUPPLIES COOK L SUPPLY COOK & CONTRACT NO Mille Rud Als Ashise Secole Laber, Inc. 12 E. Cultierres St. MAE 552514 56472 IZ IVE HALL 1531562-11,19,20 Mixer-Amplifter mta Barbara, CA 93101 IT ON AS CHARLIT ON A REAL REALS WAS BEEN AT STRUCK SOME TWEE & MOT 6/9/98 STATE OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY IN ACTION I SOUTH IN IL CONSTITUTE B. Sall Ber. When shoughed seasing against Approve use es Mixer-Amplifiers measure high for trying to improve this peremeter it became apparent that we had reached a limit 7438 15. gain flamens 7439 Magazzres: in improving the gain flat-7440 0.55 db ppg 7434 7A29 Dens. 0,60 7438 7A30 Ħ 0.70 Corrective sotion is not 7A39 1.00 possible without remaking 7440 1.38 7A29 0.4959" the amplifiers. 0.50 1.00 7830 1.10 TO COMP E TELL COME STANDARD OF STANDARD VALUE OF STANDARDS THE STATE OF SEA IN STA 99 Tree or [46] L'HAMPILLE DE 192 (ET BYL Lombing Imposition) EALES NO STORME CH SCHOOL SUI SCHOOL SUI LICE SAIRS SE SE 7-1-98

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Affachment # 1 SDAX 98-119

### Hui, Joseph

From:

Kapper, Ron

Sent:

Tuesday, July 14, 1998 4:06 PM

To:

Hui, Joseph

Subject:

**RECOMMENDED DISPOSITION OF SDAR #98-119** 

Subject SDAR deals with Mixers manufactured by Spacek. The Mixers have out of tolerance Gain Flatness. Two Mixers(S/Ns 7A34 and 7A40) from this group were tested over temperature with other flight components and the flatness did not affect the performance of the Receiver channels; flatness problems tend to be integrated out. It is interesting to note that these flatness readings are an improvement over KLM worst case readings of .8 dB and 1.7 dB respectively.

Based on the testing, the Receiver Team recommends a "use as is" disposition of the SDAR.

Ron Kapper Receiver Team Leader

### READJET ELECTROSYSTEMS COMPANY

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individual components within the amplifier, or mixeramplifier combination. No corrective action is possible without remaking the amplifier from soratch.

No corrective action is recommended.

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**7A24** 

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DATE | IS, ENGINEENHE ST CARLONIS EATE SUALITY CONTRO SPECIAL INSTRUCTIONS TO SUPPLIES

final approval of this request shall apply only to the Items specified herein and shall not establish a precedent, all findings will be subject to yesification and final approval at aeec. epolyca o yroc harta ena kosseh deigiges laiestaly etabeldes, treurihe eof arvorta od trudes enidhet treurihe duchkiw

PAGE. 9

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mm	FROM:	Bill Neiman	— Fice —  DATE: 8/18/98
SPACEK LABS, INC. MM-WAVE TECHNOLOGY 212 EAST GUTIERREZ STREET ITA BARBARA, CALIFORNIA 93101	DELIVER TO:	Aerojet	PAGE:
	FAX #:	626 812 8108	
(805) 564-4404 FAX: (805) 966-3249	NAME:	Pat McKay	<del></del>

AGE:

Reference: PO# 85101

Subject: Request Aerojet withdraw Spacek SDAR# 24.

Gentlemen,

Please withdraw Spacek SDARs 24. This SDAR is no longer required since Aerojet product specification AE24869 rev C paragraph 3.2.1.15.1 changed it from acceptance test requirement to engineering data only.

For clarifications please call me at (805) 564-4404.

Sincerely,

Bill Preman

.

;

.00 5405 4

### Hui, Joseph

From: Sent:

Kapper, Ron Thursday, July 09, 1998 12:45 PM Hui, Joseph SDAR #98-126

To: Subject:

This SDAR should be cancelled. The "C" revision of the Mixer specification, AE-24869 makes this requirement "engineering data only."

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. /	My.	•	-10-98 /	1 NEC		9/10/98	31/5	·Kung	2 2111138		; ,
	-16	The T		1/17	MICIAL	Minerie	INT TO ENTER	USCANCIA	ed diaso	672	today at 11/4
. 10	W ANIXON	L OF DIE 11	JIAHE TEBUO	WALL OHLA	INSTITUTE OF	SHOUPIED	HIMIH AKE	SHALL NOT ISLA	PLECTORY, A	HIGHIS LI	er mente enfrice
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### Channel 15 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-20, S/N: 7A40)

		Sa
		~~

### TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FI	ATNESS	TEST:	ATP PARA	GRAPH	5.1.3
	MALLEUU		ZIZI ZZIXV.	I CALCAR IA	U. A.U

**GAIN FLATNESS** 

SPEC. GAIN FLATNESS

(dB)ppK

(dB)ppK

**ACC** 

1.38

1,00

### GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER

**GAIN** 

VOLTAGE

READING (dBm)

SPEC.  $\Delta G/\Delta V$ 

ACC REJ

58,66

1.25

 $\Delta G/\Delta V$ 

58.72

DATE ACC REJ

EZM

CAM501352

PART NO. 1331562- 20 6

SPACEK QA



SER NO.

7A40

TEST FAILURE:

TESTED BY: 777

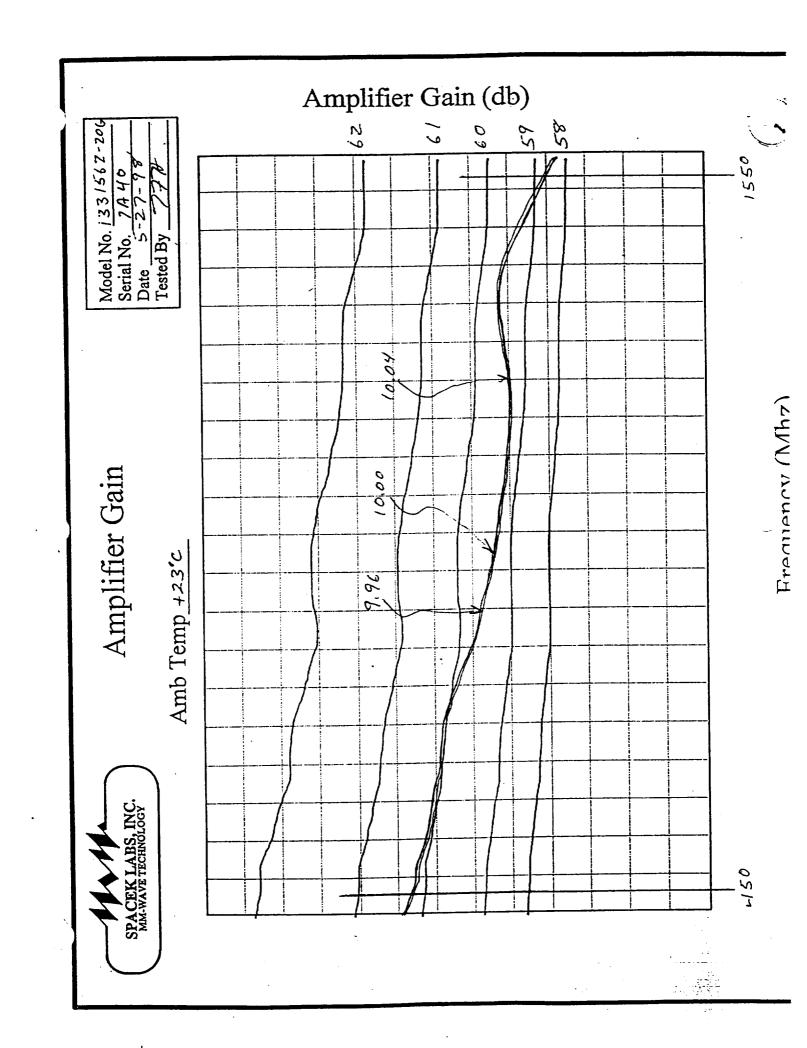
FAILURE ANALYSIS NO. \_

END DATE:

END TIME: 1600

Spacek Labs, Inc. 212 E. Gutierrez St.

Santa Barbara, CA, 93101



### TEST DATA SHEET NO. 7. AMPLIFIER TESTS

### GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal	Temperature	Rela	tive Gain	ΔG/ΔΤ	SPEC	ACC	REJ
T1	-6	GT1	60.45				
				* 0,084	0.035dB/°C	/.	QA \
T2	+8	GT2	59,28			Ţ,	1
				.0.034	0.020dB/°C	1 .	OK
T3	+28	Gтз	54,60			1	1
				. 0.075	0.035dB/°C	ŀ	40
T4	±40	GT4	57.70				1

\* Perform the following calculations and record on the TDS

$\Delta G/\Delta T =$	Gπ - Gπ+1  Ti - Ti+1	i = 1,2,3,4	$\Delta G_T = -$	2.75 dB	(QA)	FEN
$\Delta G_{TOTAL} = \Delta G$	iv + ΔGτ + 0.4 :	=3.25 dB Spec 1	1.4dB	ACC	REJ	EEN CAMBU-1352

			DATE ACC ACT
PART NO. <u>133</u>	1562-20日	SPACEK QA	6-30-98
SER NO	7440	TEST FAILURE:	
TESTED BY:	777	FAILURE ANALYSIS	NO
END DATE:	6-5-98		
END TIME:	(600	Spacek Labs, 212 E. Gutier Santa Barbara	rez St.

### TEST DATA SHEET NO. 8. AMPLIFIER TESTS

### OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

n	Δ	HZ	#

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC REJ
X X X X X X X X X	10		•		
X	20				
хх	50				
XXXXXXXX	_ 100				<del></del>
X	150				
X	200				
X	400				
X	500	<u>-2,7</u>	0,3	1.0	82
· X	1000	- 2,6	0.4	1.0	182
X	1500	-2,6	0.4	1.0	8-

### AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6 - 5-98 AMBIENT ROOM TEMPERATURE °C: 23°

AMPLIFIER	AMPLIFIER		A COX POPEN
OUTPUT	OUTPUT		AMPLIFIER
POWER	POWER	Y FACTOR	NOISE
AMBIENT (dBm)	(-77 K)(dBm)	(dB)	FIGURE (dB)
- 25.1	- 29,0	2.9	1.83

Above data taken with Daden filter attached (except -19).

### Intermediate test results for information only

PART NO. <u>133</u>	1562-20G	SPACEK QA	DATE ACC REJ
SER NO	7A 40	TEST FAILUR	E:
TESTED BY:	97 FK	FAILURE ANALY	'SIS NO
END DATE:	6-5-98		
END TIME:	1600	Spacek La 212 E. Gu Santa Bar	
		Santa San	

### TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

### NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE 6-24-98AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER- AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER- AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER- AMP. NOISE FIGURE (dB)	SPEC. MIXER- AMP. NOISE FIGURE (dB)	ACC	REJ
-6	109	-24.20	-25,45	1,25	4.8	6.5	100	
<u>+8</u>	110	-24.40	-25,60	1.20	4.9	6.5	To	
+28	111	-24.60	-25.80	1.20	4.9	6.5	7	
440	<u> </u>	-25,00	- 26:15	1.15	511	6.5	04	
Noise figure change 0,3 dB Spec is .5dB peak to peak on -20 ACC REJ NOTE: Above data to be taken with the Daden filter, except on the -19 unit.								

### NEAT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 2-22-78 Ambient Room Temperature °C: 24

Attach computer generated  $NE \Delta T$  spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0,059

Record Nps(K) O.15 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC REJ

SPACEK QA 2-30-98 Q4
TEST FAILURE:
FAILURE ANALYSIS NO
Spacek Labs, Inc. 212 E. Gutierrez St. Santa Barbara,CA,93101

### SUBSYSTEM-LEVEL TEST DATA

			- Tananan

Report No. 11413 February, 1999

# CENTER FREQUENCY OF LOS

			7	
15	0.68	0.08	89.0009	
9-14 ***	57.290344	0.000086	57.290341	57.290346
∞	55.5	0.008	55.5006	
7	54.94	0.003	54.9398	
9	54.4	0.003	54.4002	
\$	53.596	0.003	53.5958	
4	52.8	0.003	52.8005	
3	50.3	0.008	50.2996	
Channel No.	Specification (GHz) *	Setting Accuracy (+/-GHz)	Measured (GHz) **	

<sup>\*</sup> Specification in vacuum condition.

<sup>\*\*</sup> Measured at ambient pressure (standard atmosphere).

<sup>\*\*\*</sup> Measured data for PLO No. 1 and No.2.

			-
1			

#### **TEST DATA**

### **FOR**

AMSU-A1-2 (P/N: 1356409-1, S/N: F04)

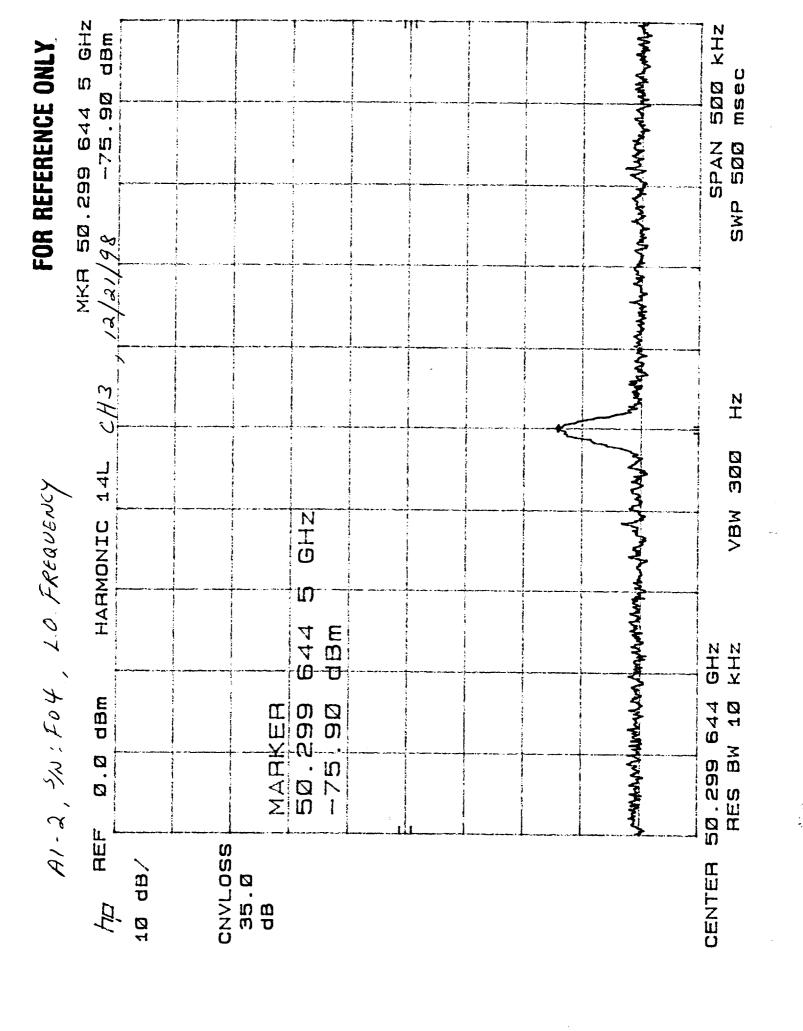
#### TEST DATA SHEET 2 LO Frequency Test Data (Paragraph 3.5.1) (A1-2)

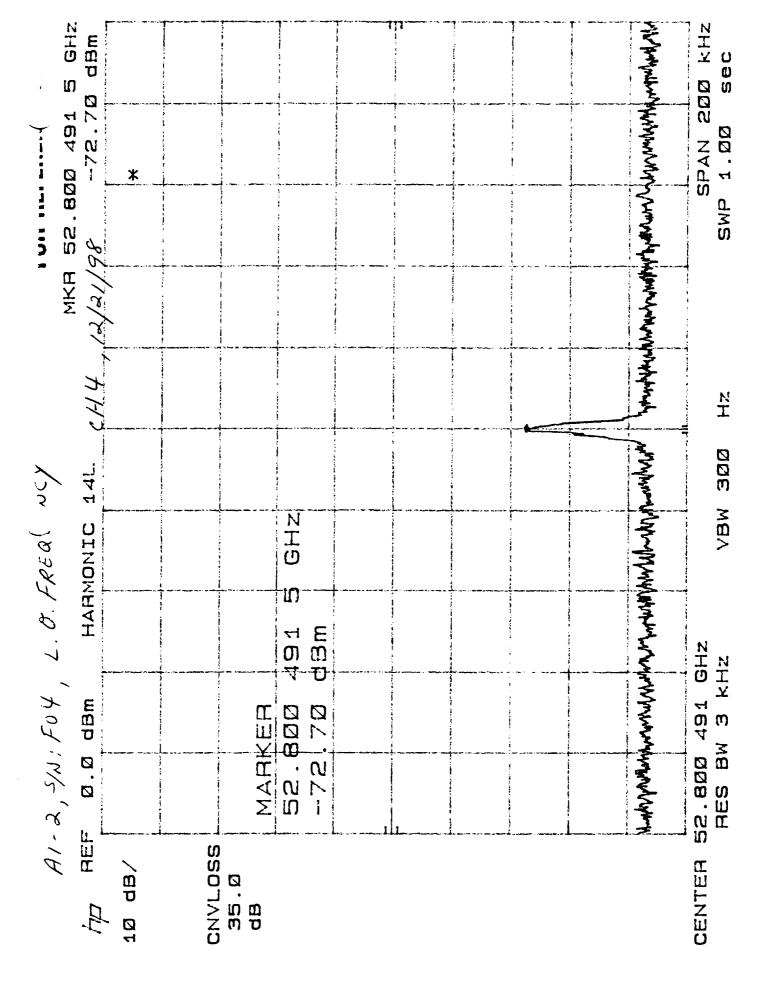
Test Setup Verified: 2, 2	Baseplate Temperature (T <sub>B</sub> ) <u>23</u> °C
---------------------------	------------------------------------------------------

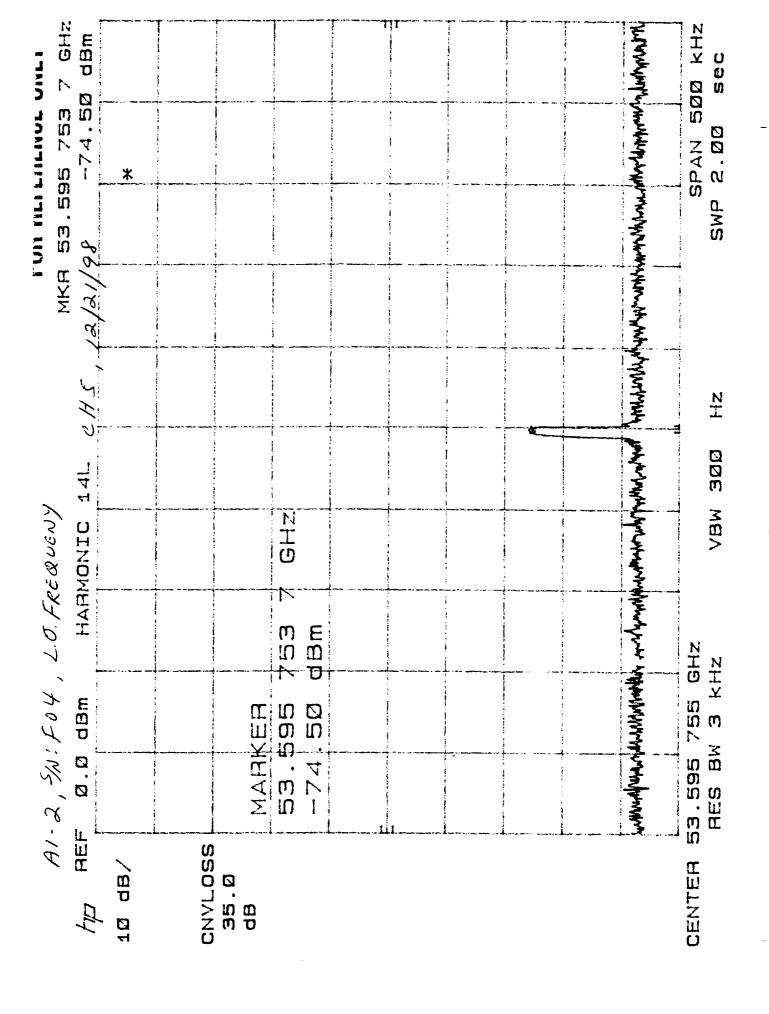
Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)		P <sub>dc</sub> (mW)			(GHz)	
nent	No.			Required (Max)	Measured	Pass/ Fail	Required	Measured	Pass/ Fail
	3	9,98	/79.3	2,700	j789.¥		50.300 ± 0.008	50.2996	P
LO	4	10.03	1765	2,700	1770,3		52.800 ± 0.003	52,8005	ρ
	5	10.00	176.7	2,700	,767.0		53.596 ± 0.003	53.5958	P
	8	9,99	181.5	2,700	1813,2		55.500 ± 0.008	55,5006	P
Mixer/ Amps	All	10.02	179.4	1,800	1797,6				
тот	ſAL			12,600	8937.5				

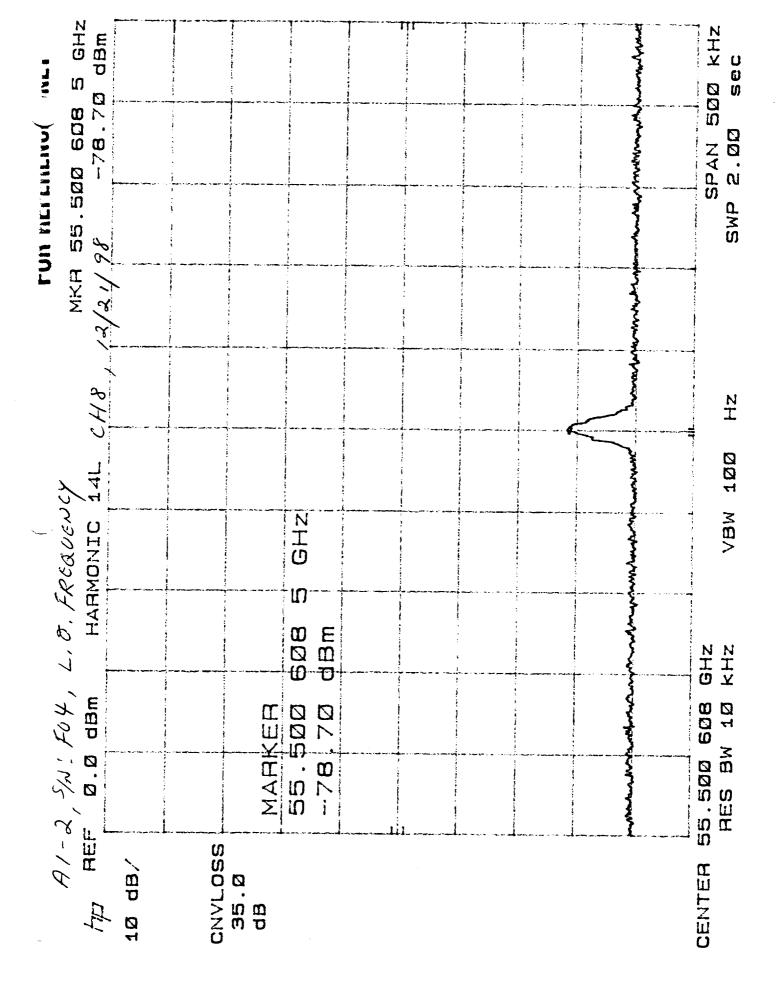
Pass = P, Fail = F

Part No.: /356409-/	Test Engineer:
C : 11	Quality Assurance: (28) C My 12 23 9%
	Date: /2/21/98









# TEST DATA SHEET 5 IF Output Test Data (Paragraph 3.5.2) (A1-2)

Test Setup Verified:	7. Imag Signature	Baseplate Temperature (T <sub>B</sub> )	24	°C
----------------------	----------------------	-----------------------------------------	----	----

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	P <sub>o</sub> (dBm)	Atten (dB)	Po	(dBm)	
nent	No.					Required	Measured	Pass/ Fail
	3	9.98	179.3	-22.70	4	-27.0 ± 1.0	- 26.78	P
	4	10.હ	176.5	-18.98	8	−27.0 ± 1.0	-27.12	P
LO	5	10.00	176.7	-19.12	8	−27.0 ± 1.0	-27,29	P.
·	8	9,99	181.5	-22.05	4	-27.0 ± 1.0	-27.00	ρ
Mixer/ Amps	All	10.02	v) 79.4					

Part No.: 1356409-1	Test Engineer:
	Quality Assurance: (24) C. V. 12 (23) GK
	Date: 12/21/98

## TEST DATA SHEET 8 (Sheet 1 of 2) Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

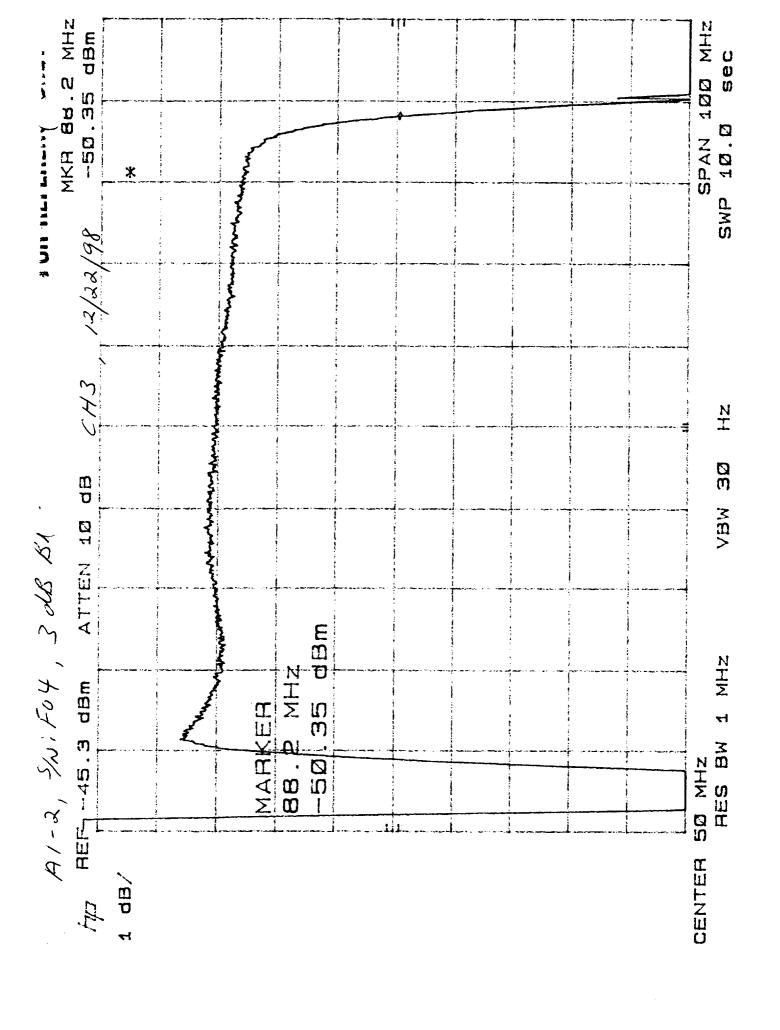
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)								
Test Setup Verified: 2.2 Baseplate Temperature (T <sub>B</sub> ) 22 °C Signature								
Compo-	Channel	V <sub>b</sub> (V)	l <sub>b</sub> (mA)		Frequency Hz)	3 dB BW F (Mi	requency lz)	Pass/ Fail
nent	No.		<u> </u>	Lower	Higher	Required Max.	Measured	
	3	9,98	179.4	8.9	88,2	90	79.3	P
	4	10.03	176.6	7.2	198.8	200	191.6	P
LO	5	10,00	176.7	31.0	199.0	170	168.0	P
	8	9,99	181.6	8.1	163,7	163	155.6	م
Mixer/ Amps	All	10.02	i74.9					
Part No.: 1356409-1 Test Engineer: Think 120098  Serial No.: FO 4 Quality Assurance: 120098								
				<del></del>		122/99		

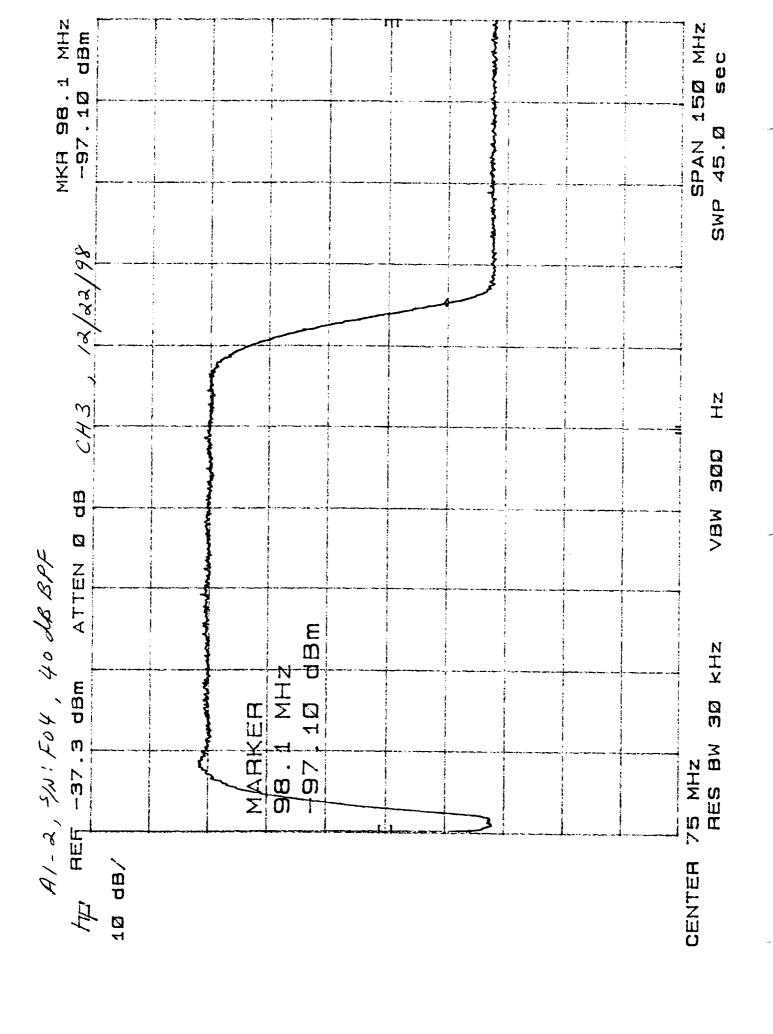
# TEST DATA SHEET 8 (Sheet 2 of 2) Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

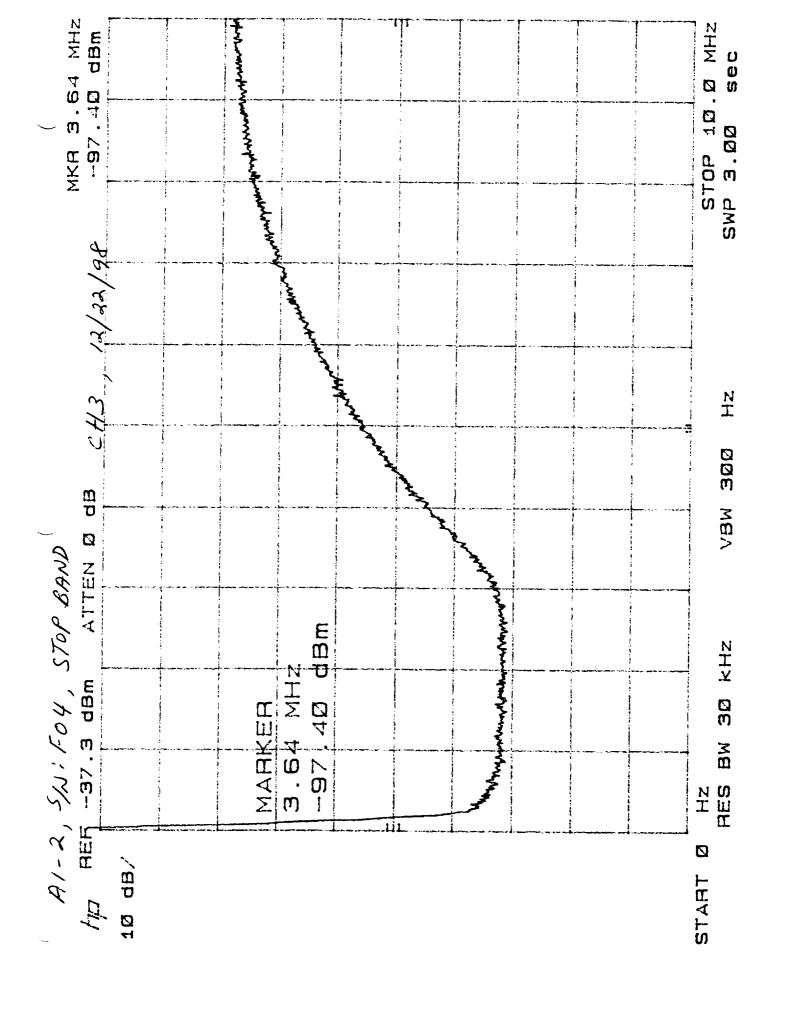
Test Setup Verified:	), )nny Signature	Baseplate Temperature $(T_B)$ $23$ °C	3
----------------------	----------------------	---------------------------------------	---

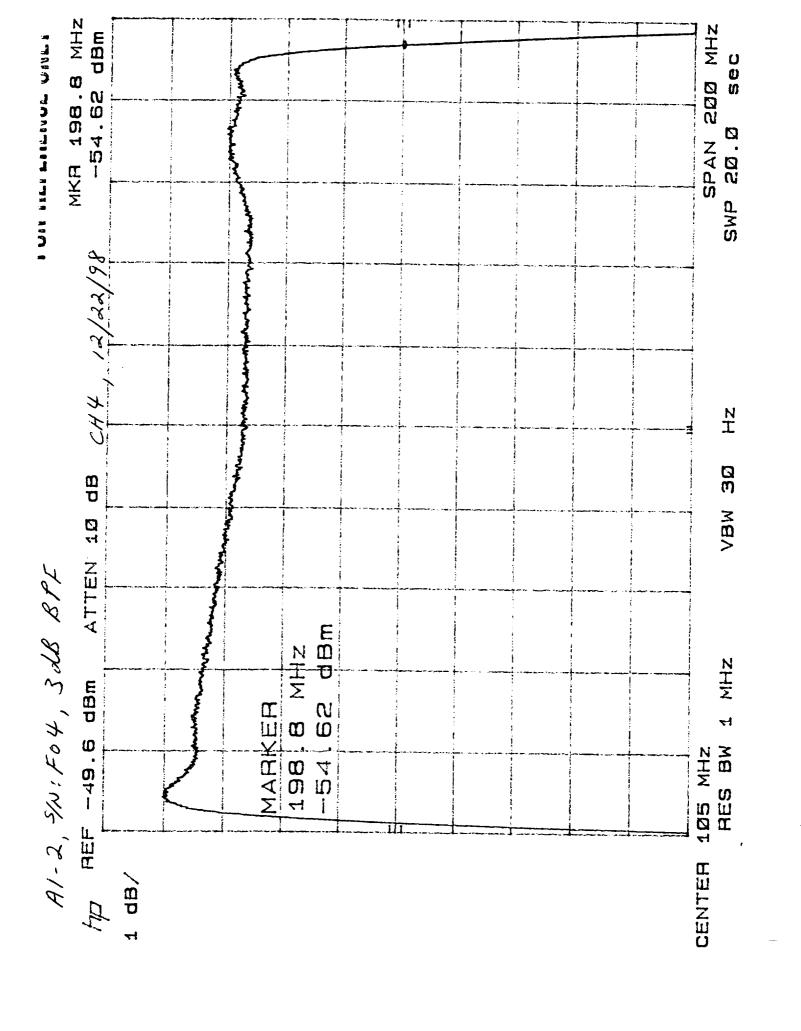
Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)		40 dB BW Frequency (MHz)		40 dB BW Frequency (MHz) (Ref. Only)	
nent	No.			Lower	Higher	Required Max.	Measured	
	3	9,98	179.4	3,6	98.1	234	94.5	P
	4	10,03	176.6	2.3	223.0	234	220,7	P
LO	5	10,00	176.7	19,3	217,3	221	198.0	م
	8	9,99	181.6	2.2	182.0	<b>42</b> 9	179,8	P
Mixer/ Amps	Ali	10,02	174.9					

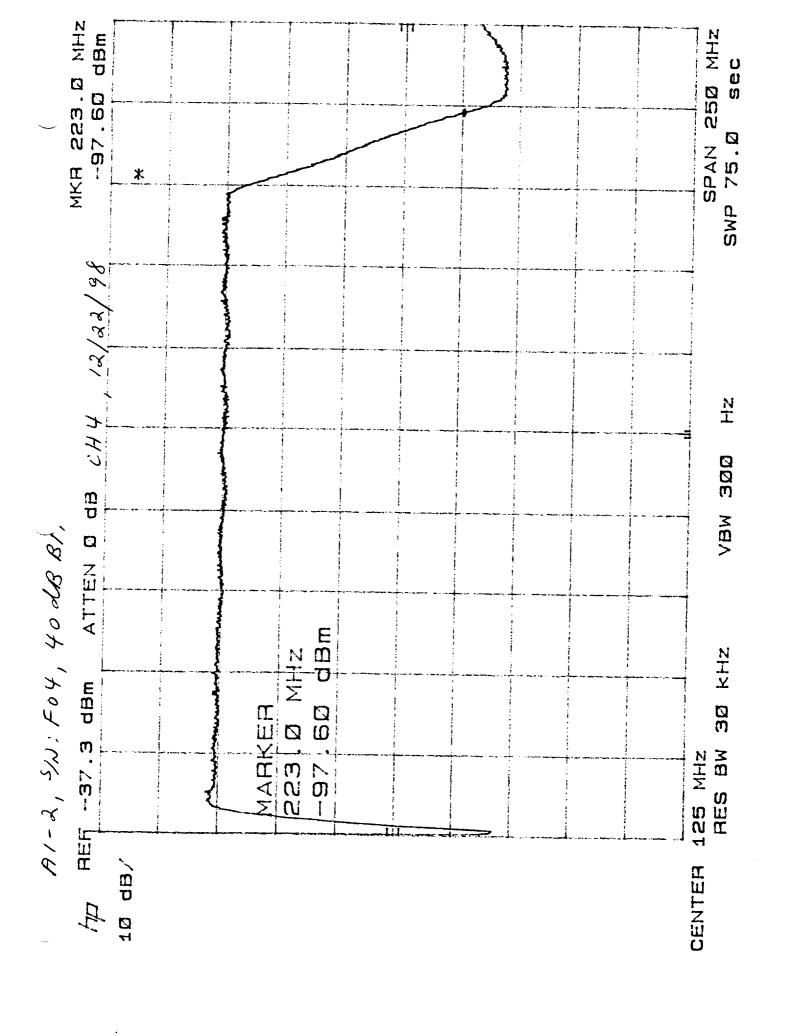
Part No.: 1356409-1	Test Engineer:
Serial No.: FO4	Quality Assurance: (7A) (172) (18)
	Date: $\frac{2/22/98}{}$

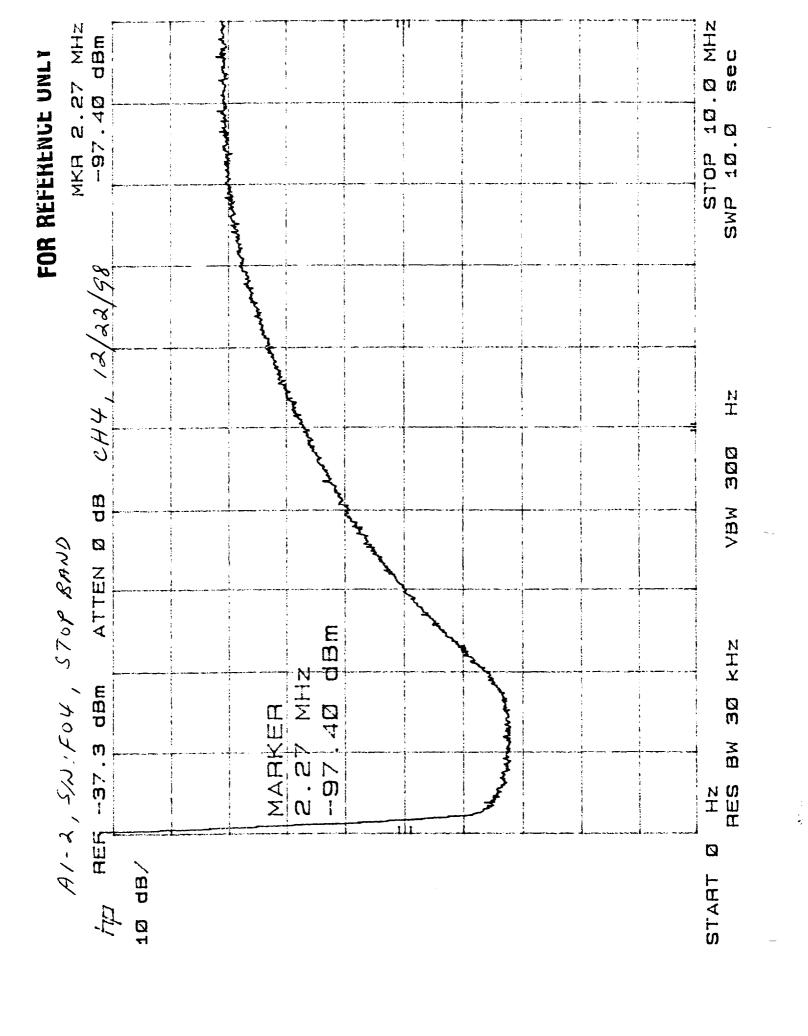


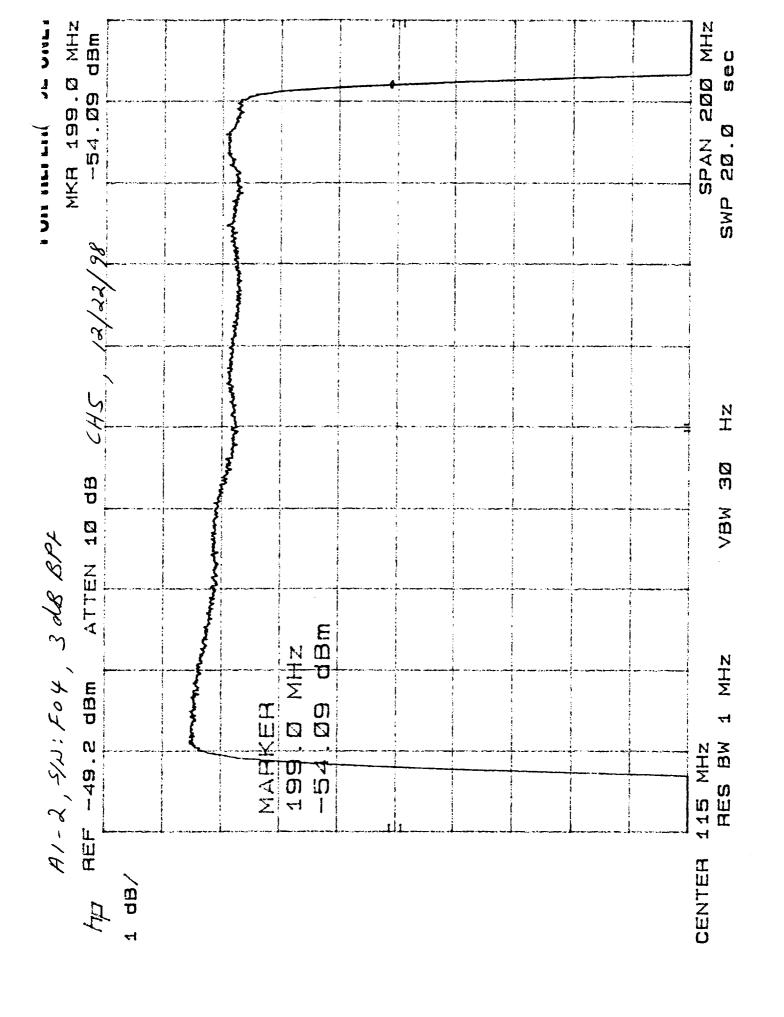


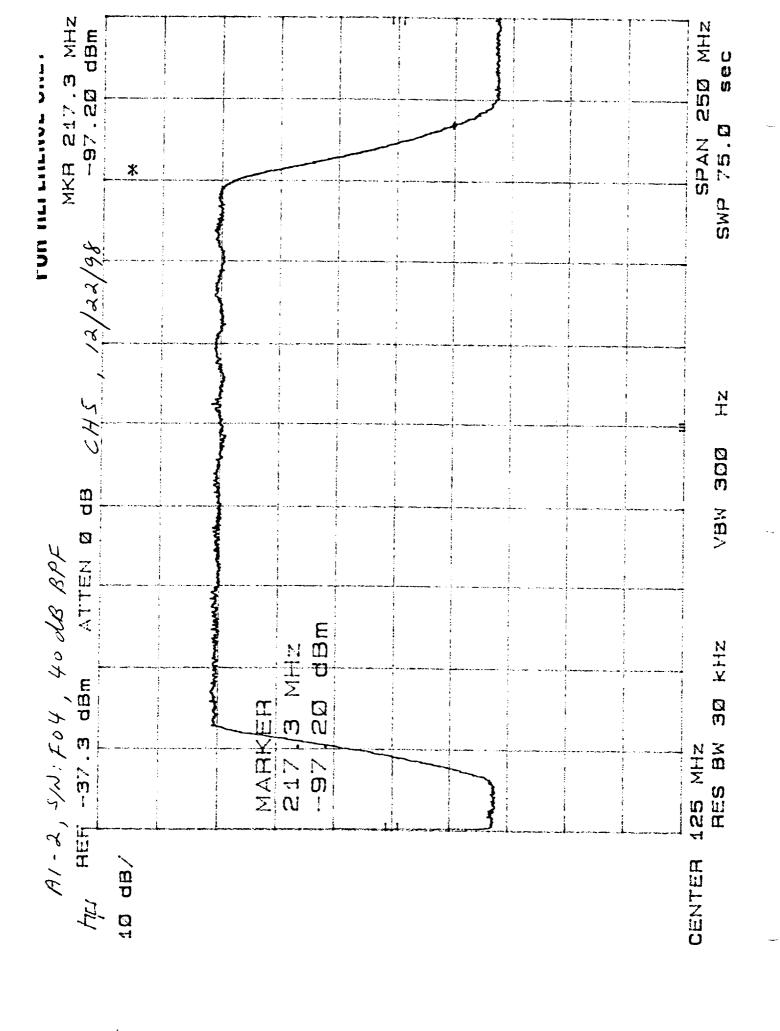


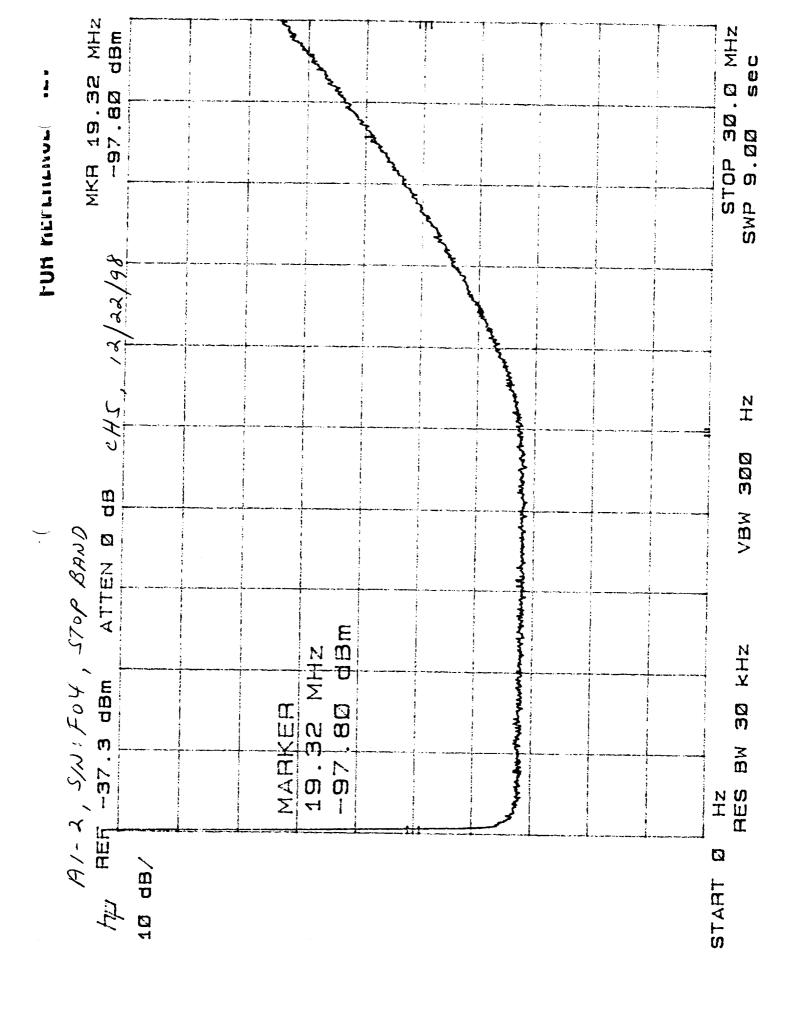


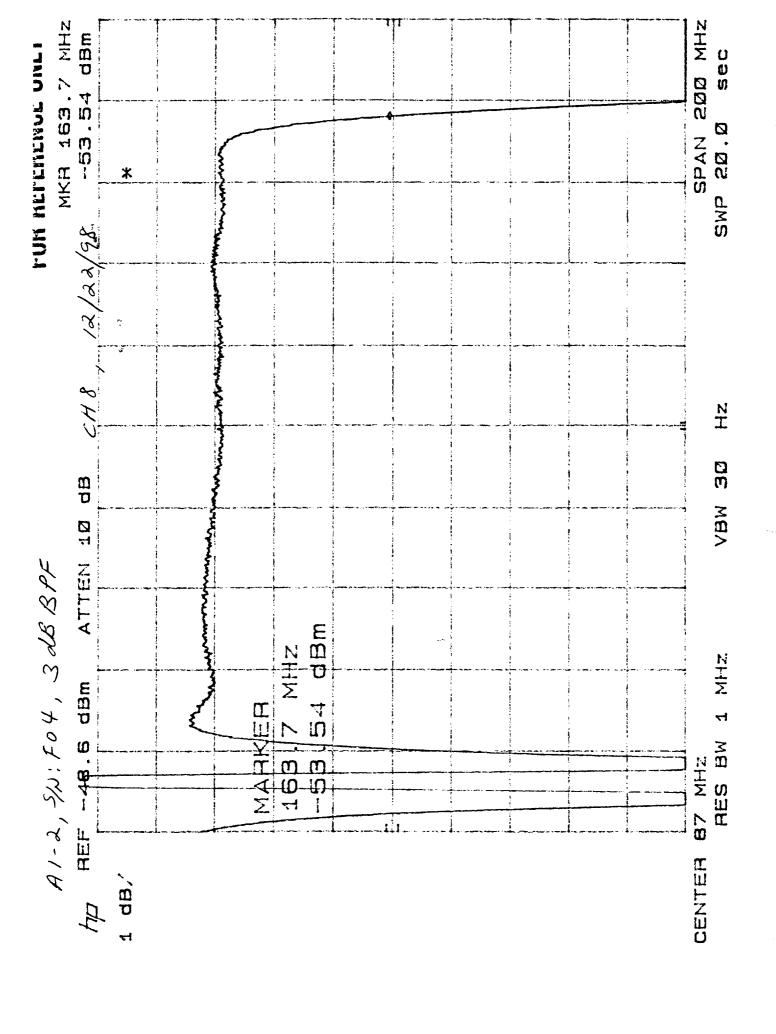


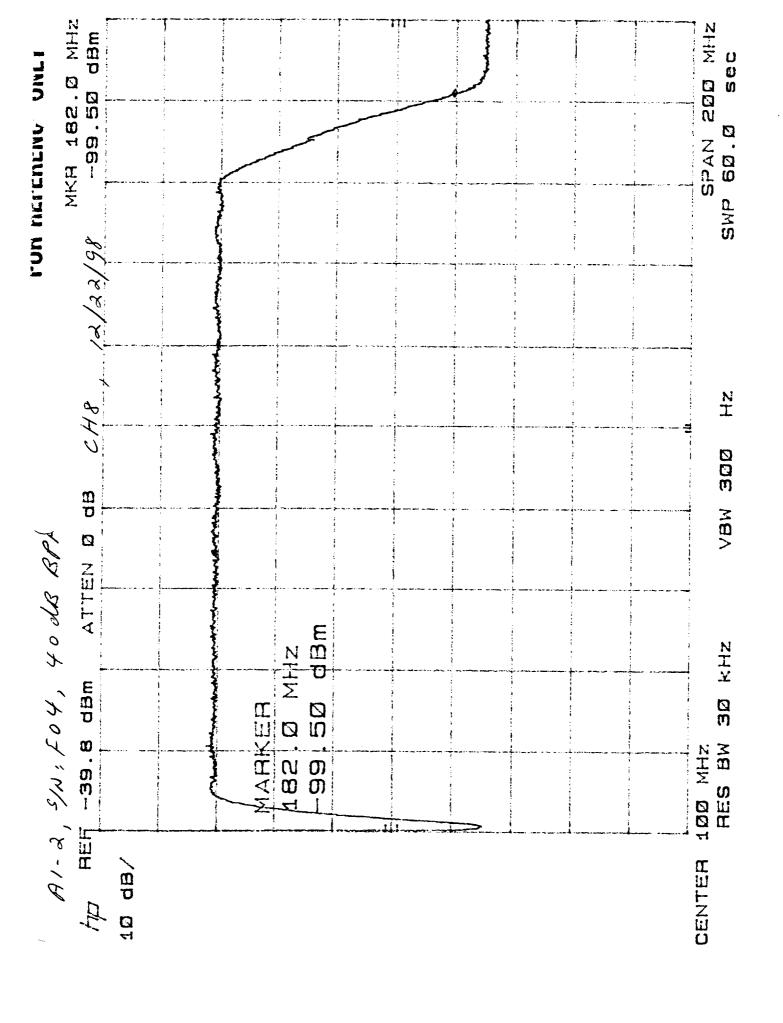


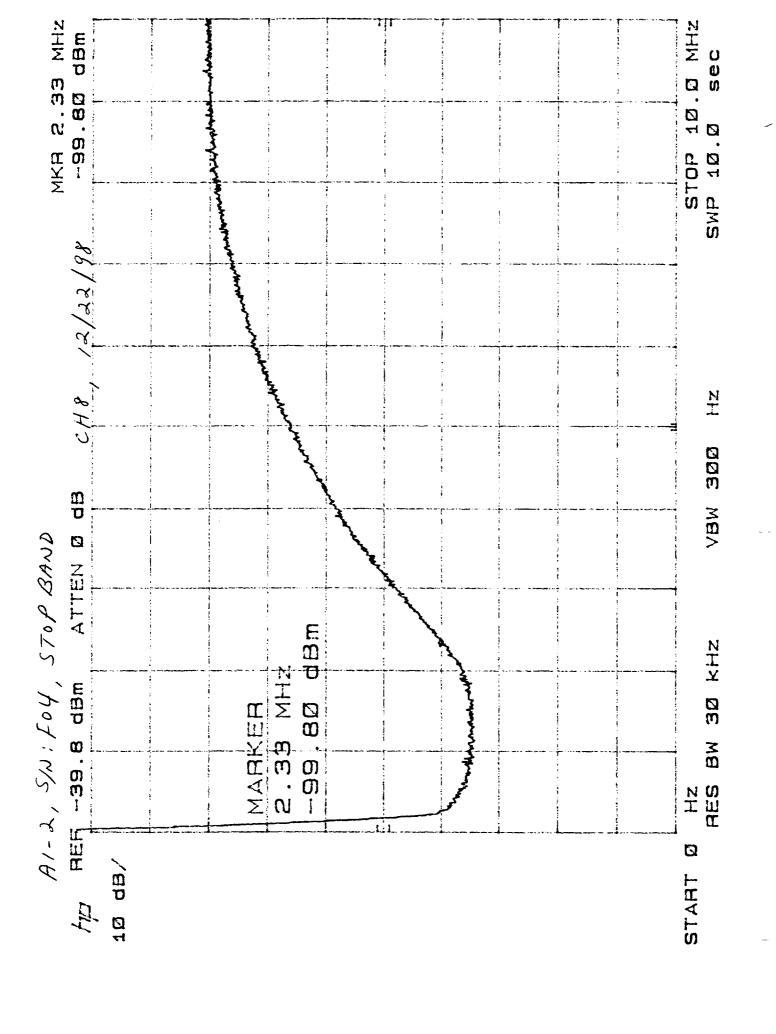












TEST DATA SHEET 11 (Sheet 1 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified:	7. Trink	Baseplate Temperature (T <sub>B</sub> ) <u>25. 0</u> °C
•	Signature	

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	Vc	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
				21.0	9 <b>8</b> 53	.000264	-194.0	1047	.00021
				21.0	-9 <b>8</b> 52	.000249	-194.0	-7046	.000184
				21.0	-9850	.000285	-194.0	7059	.00022
				21.0	.9852	.000253	-194.0	7043	.00018
LO	3	9.98	179.4	21.0	-9852	.000287	-194.0	- 7054	.000 19
	2			21.0	-9851	.000322	-194.0	7060	.00020
				21.0	:9853	.000279	-194.0	7044	.0002
				21.0	9854	.000266	-194.0	7050	.00022
				21.0	:9853	.000264	-194.0	7053	.00019
				21.0	-9853	.000278	-194.0	7041	.00019
Mixer/ Amps	All	10.02	174.9						

Part No.: 1356409-1	Test Engineer: Simb
Serial No.:F04	Quality Assurance (228) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (
	Date: $\frac{12/22/98}{}$

TEST DATA SHEET 11 (Sheet 5 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: 7. Vrindo Signature	Baseplate Temperature (T <sub>B</sub> ) <u>250</u> °C
------------------------------------------	-------------------------------------------------------

	NF (dB)				NPS (K)					
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail	
3		4.13				D.051				
		4.13				0.085				
		4.15				0.064				
		4.13				0.067				
		4.14				0.069				
		4.15				0.132				
		4.13				0.045				
		4.14				0.044				
		4.14				0.052				
		4.12				0.043				
	5.1		4.14	P	0.12		0.065	0.089	P	

Part No.: 1356409-1	Test Engineer: Y. Ysurb
Serial No.: Fo 4	Quality Assurance: (823) R. May 12 2368
	Date: 12/22/98

#### AMSU-A TEST

A1-2, S/N: F04, CH3, NF & NPS DATA, TB-25 C, 12/22/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	WES(K)
1	WARM TEST	294.15	98527314	.00025425		
2	COLD TEST	79.15	- 70471343	.00021578	4.13178165	.05060716
2	WARM TEST	294.15	98520341	.00024854		
Ÿ	COLD TEST	79.15	70455342	.00018354	4.13008753	.08534383
<u>=</u>	WARM TEST	294.15	98504543	.00028454		
·Ē	COLD TEST	79.15	70585331	.00922545	4.15211075	.08352271
7	WARM TEST	294.15	98521238	.00025772		
0	COLD TEST	79.15	70429487	.00012152	4.12594567	.06744373
ā	WARM TEST	294.15	58523885	_@@@287@@		
10	COLD TEST	79.15	70536452	<u>.00019327</u>	4.14231053	.08948873
1.1	WARM TEST	294.45	98514837	_@@@322@8		
12	COLD TEST	79.15	70596527	_@@@2@927	4.15270820	.13241280
13	WARM TEST	294.15	98525756	.00027863		
1 <u>4</u>	COLD TEST	79.15	70438508	_@@@19966	4.12584585	.04491240
15	WARM TEST	294.15	98535034	.00025517		
15	COLD TEST	79.15	70499944	.00022503	4.13535980	.04443813
17	WARM TEST	294.15	98527130	.00025385		
1 2	COLD TEST	79.15	70531044	.00019075	4.14110449	.05192212
19	WARM TEST	294.15	98524817	_0002781 <del>9</del>		
30	COLD TEST	79.15	70413541	.00019054	4.12307104	.04329115

OH. 3 ,79.3 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.13514235128

NOISE POWER STABILITY (K) - .08533807743

NOISE POWER STABILITY DELTA (K) = .0891218442889

NPS\_MAX (K) = .13241280054 NPS\_MIN (K) = .0432911582711

INTEGRATION TIME - .165

### TEST DATA SHEET 11 (Sheet 2 of 8)

Noise Figure and Noise Po-	wer Stability Test Data	(Paragraph 3.5.4) (A1-2)

Test Setup Verified:	7. Vrink Signature	Baseplate Temperature (T <sub>B</sub> ) <u>25.0</u> °C
	<b></b>	

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	Vc	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
				21.0	-9744	.000174	-194.0	730	.000156
				21.0	-9744	.000172	-194.0	-7292	.000166
				21.0	-9744	.000190	-194.0	7293	.000156
	4	10.03	176.6	21.0	-9745	.000198	-194.0	-7294	.000143
LO				21.0	-9744	.000202	-194.0	7305	.000153
				21.0	-9743	.000197	-194.0	7301	.000174
				21.0	9745	.000185	-194.0	7297	.000151
				21.0	-9746	.000206	-194.0	7303	:000203
				21.0	-9746	.000i78	194.0	-7298	.000/53
				21.0	-9747	.000220	-194.0	730z	.000159
Mixer/ Amps	All	10.02	174.9						

Part No.: 1356409-1	Test Engineer: Y. Vrinh
Serial No.: F04	Quality Assurance (22R) PM 12/23/49
	Date: 12/22/98

### TEST DATA SHEET 11 (Sheet 6 of 8) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Sett	Test Setup Verified: Y. Vink Baseplate Temperature (T <sub>B</sub> ) 25.0 °C Signature								
		NF (	(dB)				NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
4		4.68				0.012			
		4.67				0.017			
		4.67				0.069			
		4.67				0.085			
		4.69				0.092			
		4.69				0.083			
		4,68				0.056			
		4.69				0.099			
		4.68				0.036			
		4.69				0.119			
	4.95		4.68	P	0.08		0.067	0.107	P
								Pass = P,	Fail = F
Part No.:_	13	56409-	· j		Test Engine		7. Trinh	<u>,                                    </u>	
Serial No.	;	56409- F09		<del></del>	Quality Assu	urance: ( 823	) Kir	>12/23/9K	
					Date:	12/2	2/93		

#### AMSU-A TEST

A1-2, S/N: F04, CH4, NF & NPS DATA, TB=25 C, 12/22/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE 97438750	STD_DEV .00017387	NF (dB)	NPS(K)
2	COLD TEST	79.15	72974001	.00015642	4.68121515	.01239725
3	WARM TEST	294.15	97439364	.00017220		
4	COLD TEST	79.15	72921710	.00016567	4.67181552	.01708067
5	WARM TEST	294.15	97443526	.00019028		
6	COLD TEST	79.15	72930352	.00015577	4.67279937	.06890054
7	WARM TEST	294.15	97445261	.00019828		
8	COLD TEST	79.15	72943636	.00014333	4.67493375	.08453066
9	WARM TEST	294.15	97442401	.00020226		
10	COLD TEST	79.15	73046852	.00015819	4.69374025	.09190974
11	WARM TEST	294.15	97434244	.00019705		
12	COLD TEST	79.15	73006970	.00017377	4.58770341	.08256971
13	WARM TEST	2 <del>9</del> 4.15	97448376	.00018467		
1.4	COLD TEST	79.15	72973840	.00015132	4.67990085	.05601065
15	WARM TEST	294.15	97455342	.00020646		
15	COLD TEST	79.15	73032116	.00020308	4.68937150	.09875497
17	WARM TEST	294.15	97462524	.00017809		
18	COLD TEST	79.15	72976501	.00015837	4.67848662	.03588580
19	WARM TEST	294.15	97466699	.00022017		
20	COLD TEST	79.15	73023819	.00015870	4.68636950	.11939765

CH. 4 ,191.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.68163932648

NOISE POWER STABILITY (K) = .06674376204

NOISE POWER STABILITY DELTA (K) = .107000404541

 $MPS_MAX(K) = .119397649691 NPS_MIN(K) = .0123972451495$ 

INTEGRATION TIME = .165

# TEST DATA SHEET 11 (Sheet 3 of 8) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified:		Baseplate Temperature (T <sub>B</sub> ) 25.0 °C
	Signature	

Compo-	Channel	V <sub>b</sub> (V)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	V <sub>C</sub>	(V)
nent No.	No.				Mean	Standard Deviation		Mean	Standar Deviatio
				21.0	-9493	.000181	-194.0	6719	.000 14
				21.0	-9493	.000179	-194.0	6717	.00016
				21.0	-9495	.000214	-194.0	6716	.00015
				21.0	9495	.000195	-194.0	-6714	.000/8
LO	5	10.00	176.7	21.0	-9496	.000206	-194.0	-67/7	.00015
	2			21.0	-9497	.000222	-194.0	-6716	.00015
				21.0	-9497	.D00179	-194.0	-6722	100013
·				21.0	-9497	.000192	-194.0	-6724	.00014.
·				21.0	<del>-19497</del>	.000184	-194.0	-6720	.00013
				21.0	-9497	.000209	-194.0	-6724	.00016
Mixer/ Amps	All	10.02	174.9						

Part No.:	1356409-1	Test Engineer: Y. Vinh
Serial No.:	F04	Quality Assurance: (2) 23 98 (823)
		Date: 12/22/98

		NF	(dB)		T		NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fai
5		4.02				0.007			
		4.02				0.018			
		4.01				0.089	*		
		4.01				0.057			
		4.01				0.076			
		4.01				0.10 Octih			
		4.02				0.019			
		4.02				0.050			
	·	4.01				0.036			
		4.02				0.081			
	5.1		4.02	P	0.08		0.053	0.093	P
							Р	ass = P,	Fail = F
Part No.:	13564	09-1	18-18		Test Enginee	r: <u> </u>	2rinh	121	
Part No.: Serial No.:	13564 F04	09-1			Test Enginee Quality Assu	rance: (822)	12.1/2~>	12/23/99	•

#### AMSU-A TEST

A1-2, S/N: F04, CH5, NF & NPS DATA, TE=25 C, 12/22/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	294.15	94931847	.00018051		
2	COLD TEST	79.15	67189504	.00014788	4.01852550	.00660966
3	WARM TEST	294.15	94934731	.00017887		
4	COLD TEST	79.15	67170797	.00016442	4.01526038	.01761196
5	WARM TEST	294.15	94952639	.00021399		
6	COLD TEST	79.15	67161185	.00015786	4.01175599	.08910400
7	WARM TEST	294.15	94951039	.00019468		
8	COLD TEST	79.15	67135165	.00017966	4.00784739	.05667526
9	WARM TEST	294.15	94955077	.00020559		
10	COLD TEST	79.15	67174925	.00015118	4.01364577	.07637518
1.1	WARM TEST	294.15	94988885	.00022157		
12	COLD TEST	79.15	67164377	.00015277	4.01067536	.09950416
13	WARM TEST	294.15	94967535	.00017865		
14	COLD TEST	79.15	67220061	.00013625	4.01935948	.01928504
15	WARM TEST	294.15	94971600	.00019168		
16	COLD TEST	79.15	67235030	.00014437	4.02126300	.05024625
17	WARM TEST	294.15	94974569	.00018645		
18	COLD TEST	79.15	67195209	.00013809	4.01465655	.03648638
19	WARM TEST	294.15	94955965	.00020854		
20	COLD TEST	79.15	67235084	.00016323	4.02189972	.08115175
						– –

CH. 5 ,188 MHz MHz

NOISE FIGURE AVERAGE (d5) = 4.0:549230858

NOISE POWER STABILITY (K) = .0533049642645

NOISE POWER STABILITY DELTA (K) = .052894499988

INTEGRATION TIME = .185

# TEST DATA SHEET 11 (Sheet 4 of 8) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified:	7. Vrinh Signature	Baseplate Temperature (T <sub>B</sub> ) 25.0 °C	

Compo-	Channel	V <sub>b</sub> (V)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	ν <sub>c</sub>	(V)			
nent f	No.			Mean	Standard Deviation		Mean	Standar Deviatio				
į				21.0	<i>9555</i>	.000205	-194.0	:6967	.00015			
				21.0	-9552	.000220	-194.0	:6965	.00013			
				21.0	-9551	.000194	-194.0	:6967	.00015			
		9.99					21.0	79552	.000233	-194.0	76963	.00016
LO	8		181.6	21.0	-955i	.000184	-194.0	-6966	.00015			
				21.0	-9554	.000227	-194.0	76969	.00016			
					:		21.0	<i>-9552</i>	.000207	-194.0	76958	.00016
				ય.0	-955 <i>5</i>	.000202	-194.0	76963	.00014			
				21.0	-9555	.000206	-194.0	-6966	.000/6			
				21.0	:9553	.000 206	194.0	-6970	.00023			
Mixer/ Amps	All	10.02	174.9									

Part No.:	1356409-1	Test Engineer: Y. Vrink
Serial No.:	F04	Quality Assurance: (822) (1) (1) (1) (1) (1)
		Date: 12/22/98

### TEST DATA SHEET 11 (Sheet 8 of 8)

			re and Noise	Power Stabi	ility Test Dat	a (Paragraph	3.5.4) (A1-2	2)	
Test Seti	up Verified		ature	Basepla	ite Temperati	ure (T <sub>B</sub> ) <u>24</u>	5.0 °C		
			(dB)				NPS (K)		
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
8		4.35				0.066			
		4.35				0.095			
		4.36				0.037			
		4.35				0.113			
		4.35				0.034			
		4,36				0.105			
		4.34				0.070			
		4.34				0.04			
		4.35				0.068			
		4.36				0.07			
	5.0		1.35	P	0.08		0.072	0.079	P
							F	ass = P,	Fail = F
Part No.:	1356	409-1			est Engineer		7. Zruli		
Serial No.:_	F	04		(	uality Assur	ance: [L]	Minorals	13/9h (383)	
					Pate:	1	193		

#### AMSU-A TEST

A1-2, S/N: FØ4, CH8, NF & NPS DATA, TB=25 C, 12/22/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	294.15	95549754	.00020455		
2	COLD TEST	79.15	69672619	.00015048	4.35077603	.06583409
3	WARM TEST	294.15	95522862	.00022036		
4	COLD TEST	79.15	69653979	.00018227	4.35093954	.09482390
5	WARM TEST	294.15	95508963	.00019363		
6	COLD TEST	79.15	69669555	.00015738	4.35528146	.03685593
7	WARM TEST	294.15	95522161	.00023272		
8	COLD TEST	79.15	69630865	.00016723	4.34712670	.11330405
9	WARM TEST	294.15	95508681	.00018392		
10	COLD TEST	79.15	69656857	.00015331	4.35317137	.03431587
11	WARM TEST	294.15	95537548	.00022680		
12	COLD TEST	79.15	69590413	.00016496	4.35528260	.10484557
13	WARM TEST	294.15	95524885	.00020669		
14	COLD TEST	79.15	69581443	.00016144	4.33846706	.07021698
15	WARM TEST	294.15	95553465	.00020192		
16	COLD TEST	79.15	69627677	.00014873	4.34274497	.05984435
17	WARM TEST	294.15	95546808	.00020573		
18	COLD TEST	79.15	69656876	.00016824	4.34848284	.06831324
19	WARM TEST	294.15	95529852	.00020633		
20	COLD TEST	79.15	69701375	.00023633	4.35808350	.06976906

CH. 8 ,155.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.35003939333

NOISE POWER STABILITY (K) = .0718123038955

NOISE POWER STABILITY DELTA (K) = .0789881763778

 $NPS_MAX(K) = .113304047064$   $NPS_MIN(K) = .0343158706866$ 

INTEGRATION TIME = .165

# TEST DATA SHEET 17 Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A1-2)

Test Setup Verified:	). Trusy Signature	Baseplate Temperature (T <sub>B</sub> )_	20	_°C
	Signature			

Reference Designation	Specification	Measured Value	Pass/Fail
RT 41	2200 ± 100 Ω	2/45 Ω	P
RT 42	2200 ± 100 Ω	2/47 Ω	P
RT 43	2200 ± 100 Ω	2144 0	P
RT 44	2200 ± 100 Ω	2/47 Ω	ρ
RT 12	2200 ± 100 Ω	2143 Ω	P
RT 17	2200 ± 100 Ω	2144 Ω	P
RT 18	2200 ± 100 Ω	2143 Ω	ρ
RT 19	$2200 \pm 100 \Omega$	2/43 Ω	P
RT 22	2200 ± 100 Ω	2148 Ω	p
RT 33	2200 ± 100 Ω	2142 0	ρ
TB 58	3000 ± 100 Ω	3070 Ω	P
TB 59	3000 ± 100 Ω	3072 0	P
TB 54	4.1 – 4.6 V	4.29 V	P

Part No.: 1356409-1	Test Engineer: The The
Serial No.:	Quality Assurance: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	Date: 12/2//98

#### TEST DATA SHEET 20 Survival Heater and Thermal Switch Test Data (Paragraph 3.6.2) (A1-2)

Test Setup Verified: 7.7 Signature	Baseplate Temperature $(T_B)$ $20$ ${}^{\circ}C$
------------------------------------	--------------------------------------------------

Open Switch		Closed Switch			
Reference Designation	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail
HR1/TS1	710M2	P		45.6 r	P
	710HR	P	40 - 48 Ω	44.42	P
HR2/TS2	NOMR	P		45,21	P
_	>10MR	P		44.22	P

Part No.: 1356409-1	Test Engineer:		
Serial No.: FO 4	Quality Assurance: (7A) CM 12/5/5		
·	Date: $12/21/98$		

### TEST DATA SHEET 22 (Sheet 2 of 3)

Bias Voltage Verification Test Data (Paragraph 3.6.3) (A1-2)

Test Setup Verified: 7. Signature	Baseplate Temperature (T <sub>B</sub> ) 20	_°C
-----------------------------------	--------------------------------------------	-----

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 3, 4, 5, 8	+10 ±0.1	10,01 V	P
DRO Ch 5	+10 ±0.1	9,99 V	P
DRO Ch 4	+10 ±0.1	10.01 V	P
DRO Ch 3	+10 ±0.1	9.97 V	P
DRO Ch 8	+10 ±0.1	9,98 V	P

Part No.: /356409-1
Serial No.: F04

Quality Assurance: (7A) (23/61)

Date: 12/21/98

ı			

### **TEST DATA**

### **FOR**

AMSU-A1-1 (P/N: 1356429-1, S/N: F04)

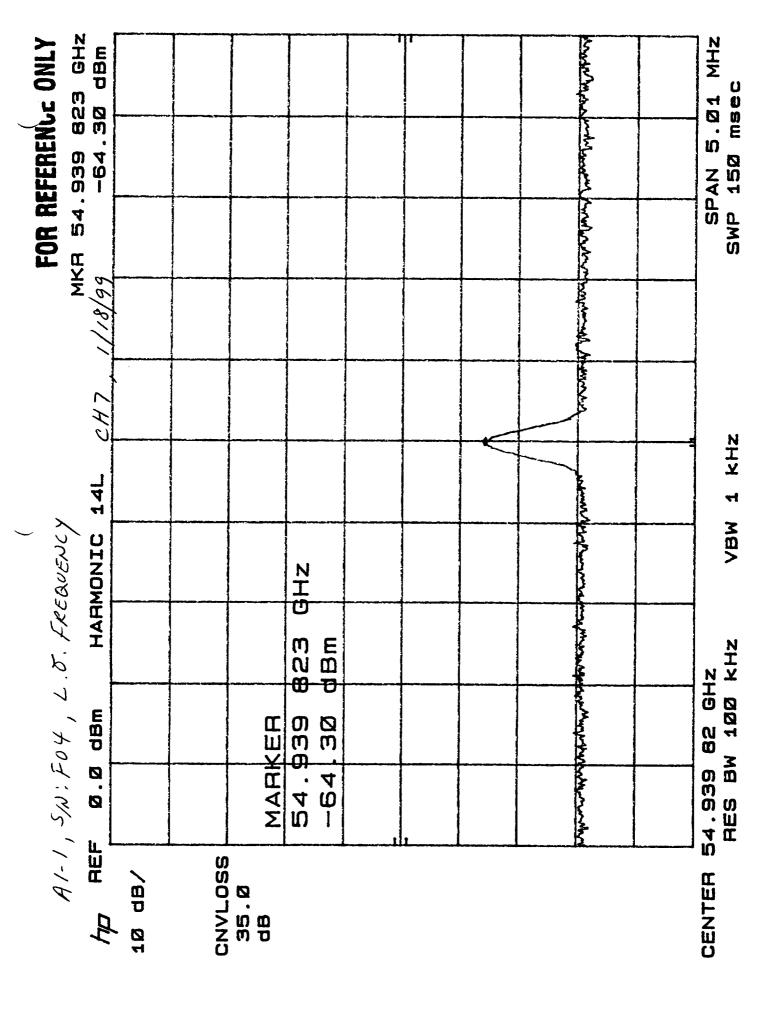
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			·
1			

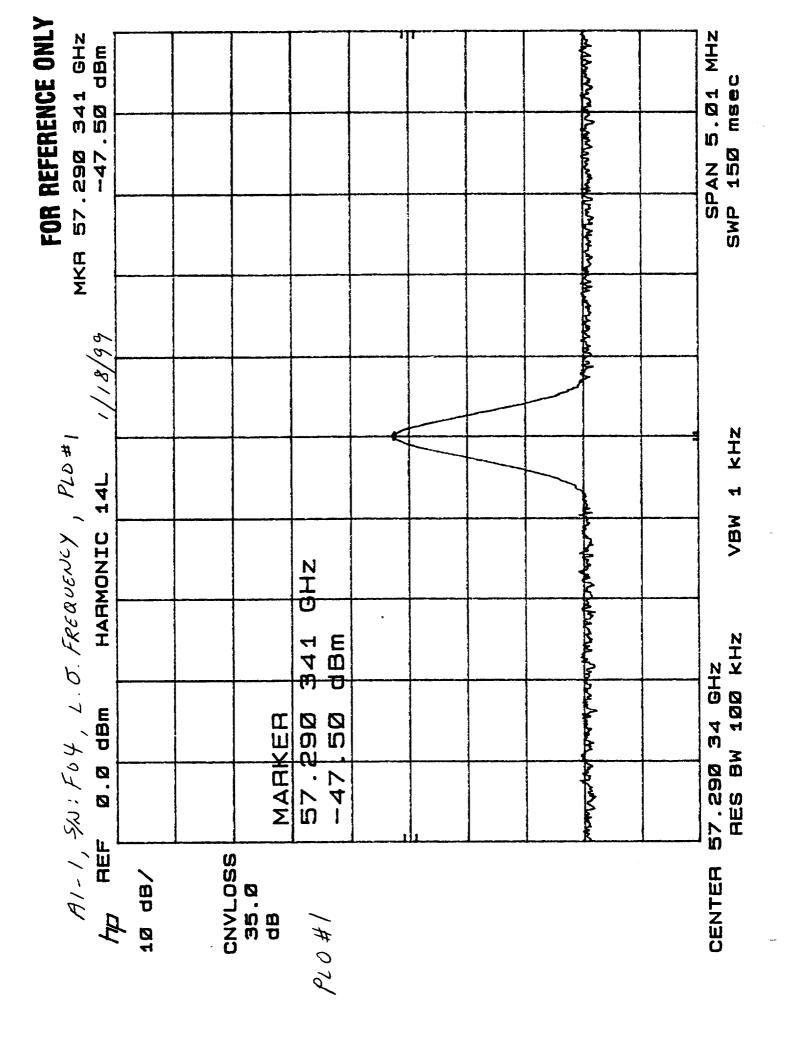
#### **TEST DATA SHEET 1**

LO Frequency Test Data (Paragraph 3.5.1) (A1-1)

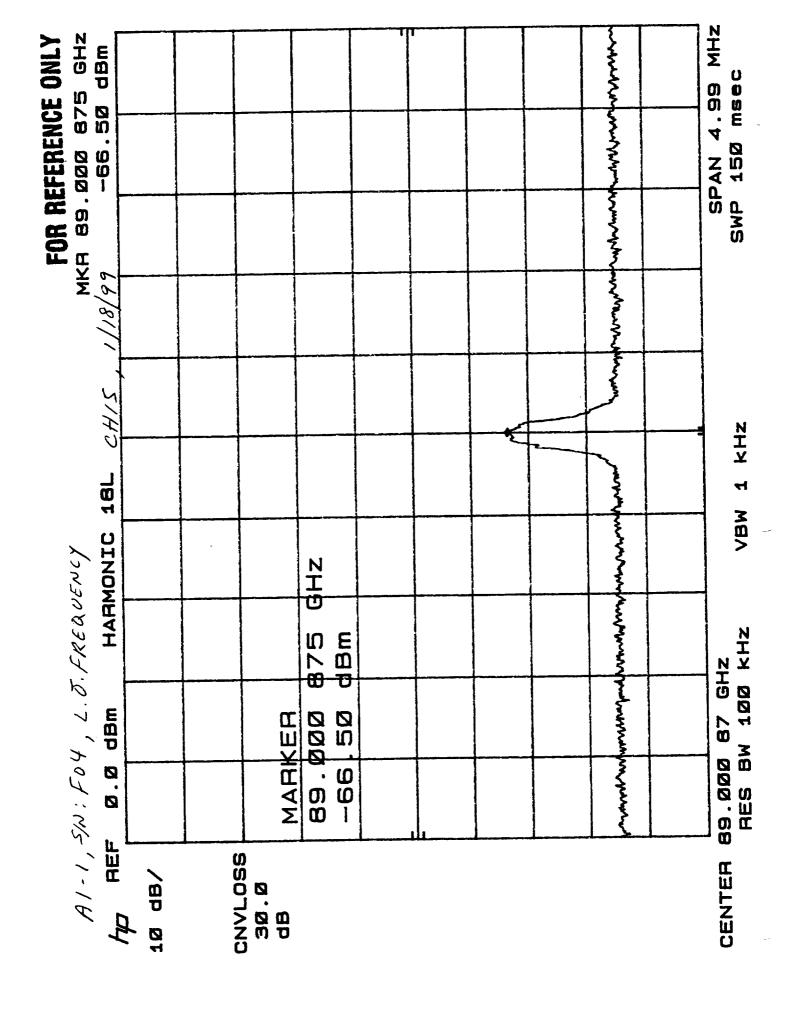
Test Setup	Verifi	ed:	Signature	<del></del>	Baseplat	Baseplate Temperature (T <sub>B</sub> ) <u>26</u> °C					
Compo-	С	hannel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)		P <sub>dc</sub> (mW)		f <sub>o</sub> (GHz)			
nent		No.			Required (Max)	Measured	Pass/ Fail	Required	Measured	Pass/ Fail	
		6	9.97	187.4	2,700	1868,4	P	54.400 ± 0.003	54.4002	ρ	
		7	<del>                                     </del>	187.8	2,700	1864,9	ρ	54.940 ± 0.003	54,9398	P	
		9	Posi-		9,000						
		10	tive	525.5	(13,500)*	7950.8	P				
	LO	11	15.13			7 75078		57.290344	57.290341	P	
	No.	12	Nega-		1,500			± 0.000086			
LO	1	13	tive	-1162		972.8	P				
			-15.13	67.3		1/10.0	/				
		9	Posi-		9,000						
		10	tive	S33.4	(13,500)*	8070.3	ρ				
	LO	11	15.13	۱،دند		0010.3	′	57.290344	57.290346	P	
F	No.	12	Nega-		1,500			± 0.000086			
	2	13	tive	701		1060.6	ρ				
		14	-15,13	-/0.1							
		15	14.88	183.1	3500	2724.5	ρ	88.980 ± 0.080	89.0009	ρ	
Mixer/ Amps		All	9.94	244.2	2,550	2427.3					
IF Amps		All	7.95	266.4	5,500	2117.9					
			The second of the second	Primary	24,510	19926.6					
				(LO#1)-	(29,010)*	1 / / / / / / / /					
T	OTAL		Redu	indancy (LO#2)	24,510 (29,010)*	20133.9					
* Indicates	require	ed values f	or the PL0	) specifie	d in AE-266	60.		P	ass = P, F	ail = F	
		ock Detect		·			O 2 Loci	C Detect	,		
Part No.:	13	56429	5-/			Test Engineer	r: /	hutten	<b>.</b>		
Serial No.:_			· · ·				~	2000	- a - 1 -	7	
PETIAL INO.:				,		Quality Assur		_	www	4	
<del></del>			***, **,		]	Date: //	18/9	7			

FOR REFERENCE ONLY





hn HEF	HEF B.B dBm HARMONIC 14L	dBm	HAH	HARMONIC	7 ' 761 14L	)	MKi	MKR 57.298		346 GHz
10 dB/	1									4
מ כ כ										
35.8 dB	MARKER R	X E B								
C# 07d	57.29Ø -59.1Ø	i	346 0 8 0 8	GHZ						
	معبالاسيدكيما	serting of the second	يود سرد نمير المعطور خود عالم ومرد نادي والمراد المراد r was the	An abo	***	ter a setting than the	Volument Processing by Co.	A CONTRACTOR	deamapa Cas	
CENTER	57.29Ø RES BV	M 34 GHZ BW 100 K	z KHz	VBM	4 X X		_	SWP 15	4 0	. 99 MHz



## TEST DATA SHEET 4 IF Output Power Test Data (Paragraph 3.5.2) (A1-1)

Test Setup Verified:	7. Trinh	Baseplate Temperature (T <sub>B</sub> ) 27.0 °C
	Signature	

Compo-	C	hannel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	P <sub>o</sub> (dBm)	Atten (dB)	P	o(dBm)	
nent		No.					Required	Measured	Pas: Fai
		6	9.97	187.4	- 19.01	8	-27.0 ± 1.0	-27.20	P
		7	9.93	187.8	-19.15	8	-27.0 ± 1.0	-27.34	P
		9	Posi-		-21.43	5	-27.0 ± 1.0	-26.46	P
		10	tive		-22.34	5	-27.0 ± 1.0	-27.28	P
	ιο	11	+15.13	527.3	-19.77	7	-27.0 ± 1.0	-26.96	P
	No.	12	Nega-		-19.94	7	-27.0 ± 1.0	-27.10	P
LO 1	13	tive		- 20.78	6	-27.0 ± 1.0	-26.72	P	
		14	-15.13	-64.4	- 20.67	6	-27.0 ± 1.0	-26.64	P
		9	Posi-				-27.0 ± 1.0	-26.36	P
		10	tive				-27.0 ± 1.0	-27.20	P
	LO	11	+ 15.13	536.2			-27.0 ± 1.0	-26.91	p
	No.	12	Nega-				-27.0 ± 1.0	-27.04	P
	2	13	tive				-27.0 ± 1.0	-26.68	P
		14	-15.13	-70.4			-27.0 ± 1.0	-26.58	P
		15	14.88	183.8	-24.66	2	-27.0 ± 1.0	-26.59	P
Mixer/ Amps		Ali	9.93	244.4					
IF Amps		All	7.95	267.7					

Pass = P, Fail = F

Part No.: 1356429-1	Test Engineer: Y. Vrink
Serial No.: FO4	Quality Assurance: 1. Classical Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Cont
	Date: 1/18/99

# TEST DATA SHEET 7 (Sheet 1 of 2) Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified:_	Y. Yrinh Signature	Baseplate Temperature $(T_B)$ $29.0$ °C

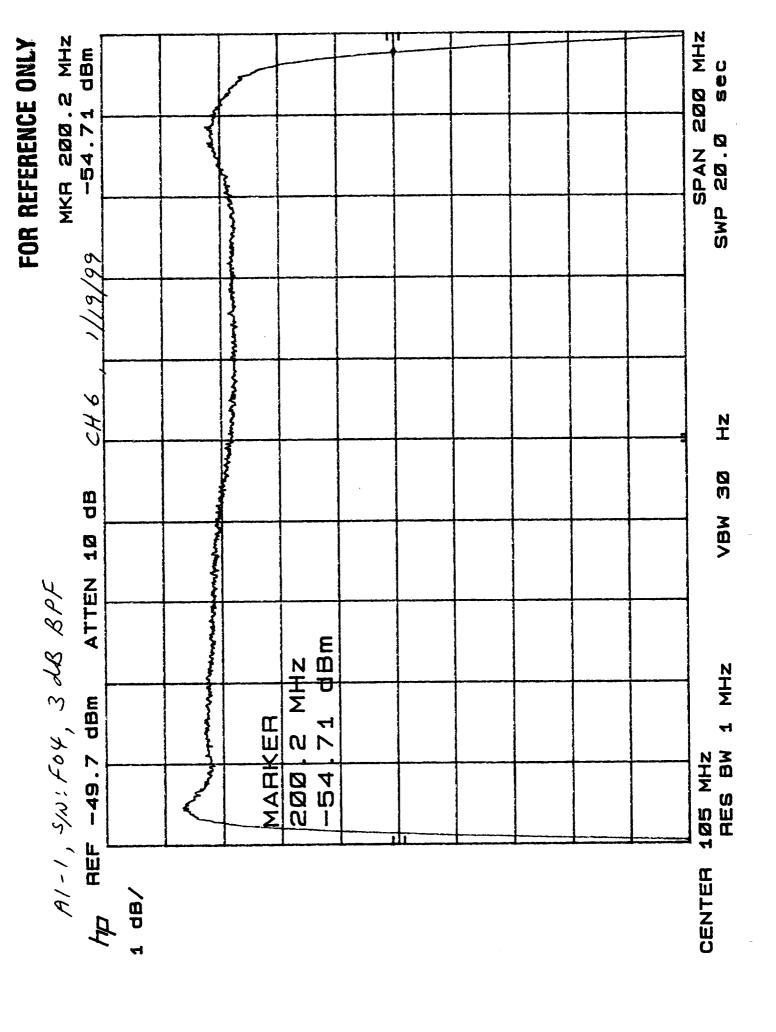
Compon	Component		V <sub>b</sub> (V)	b(V) I <sub>b</sub> (mA) 3 dB BW Frequency (MHz)		3 dB BW F	Pass/Fail		
					Lower	Higher	Required MAX	Measured	
LO		6	9.97	187.3	7.6	200.2	200	192.6	P
		7	9.93	187.9	7.0	199.0	200	192.0	P
	LO	9	Positive		9.1	162.9	165	153.3	P
	No.	10	11/12	527.3	179.7	255.5	78	75.8	P
			+15:13	521.0	257.0	291.6	36	34.6	P
	1	11			352.7	387.6	36	34.9	P
		12	Negative		292.5	307.9	16	15.4	P
					336.1	351.5	16	15.4	P
		<b>, 13</b>	-15.13	-64.4	308.3	316.2	8	7.9	P
					328.3	336.15	8	7.85	P
					316.28	319.24	3	2.96	P
l		14			325.28	328.24	3	2.96	P
1	LO	9	Positive		8.9	162.9	165	154.0	P
	No.	10			179.6	255.5	78	75.9	P
			+15:13	537.6	256.8	291.6	36	34.8	P
	2	11			352.5	387.5	36	35.0	P
		12	Negative		292.5	307.9	16	15.4	P
					336.1	351.5	16	15.4	P
		13	-15.13	-70.5	308.3	316.2	8	7.9	P
			75.70	70.5	328.3	336.2	8	7.9	P
		14			316.28	319.24	3	2.96	P
					325,28	328.24	3	2.96	P
		15	14.88	183.6	481.0	1,465.0	1000	984.0	P
Mixer/A	mps	All							
IF Am	ps	All						-	

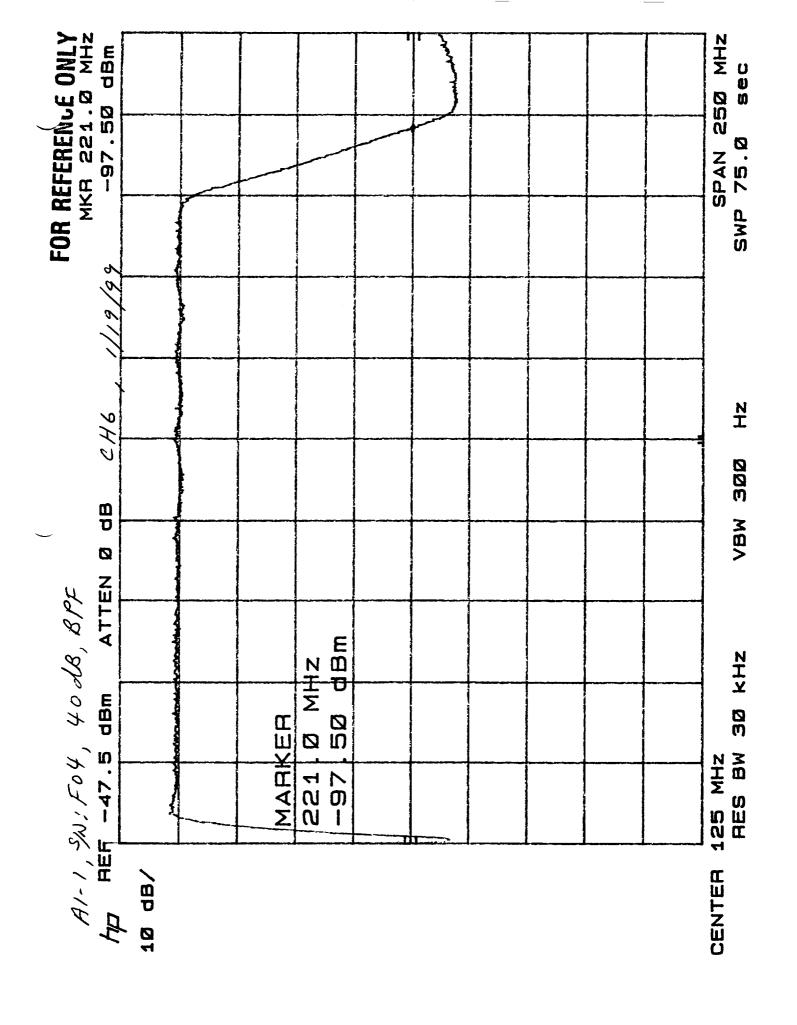
	j		•	325.28	328.24	3	2.96	P
	15	14.88	183.6	481.0	1,465.0	1000	984.0	P
Mixer/Amps	Ali							
IF Amps	All							
Part No.:	56429- F04	1			ngineer:	Vriels (268)		Wi 55 .03
				Date:_	//	9/99		

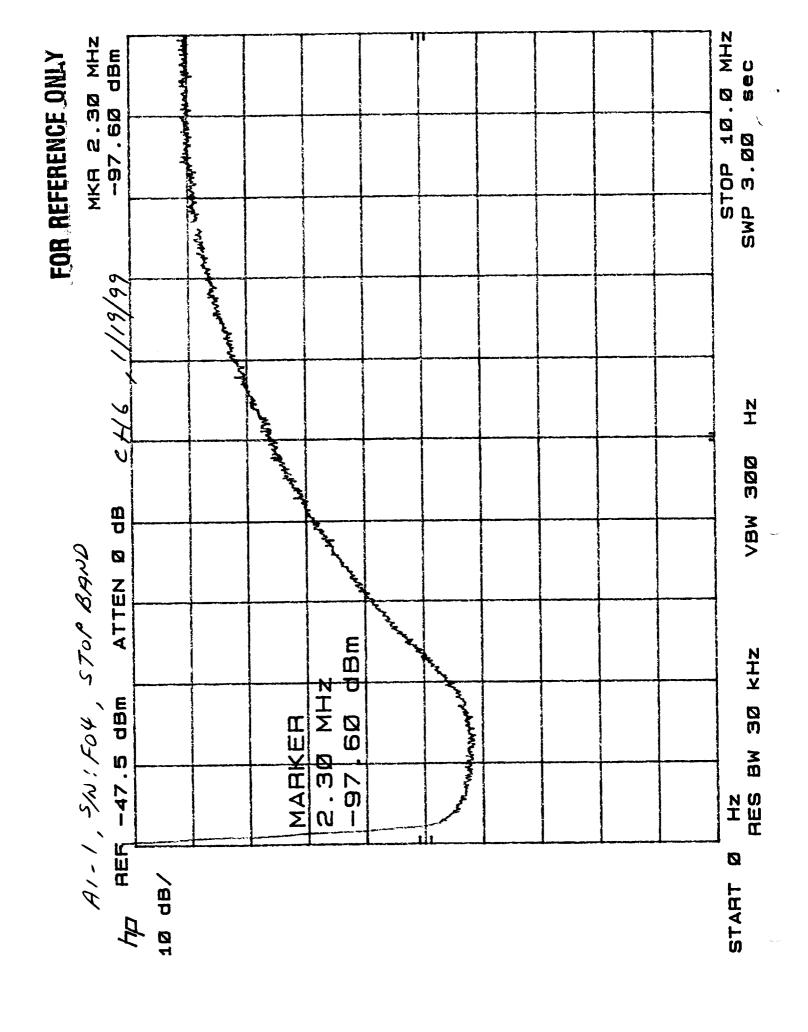
# TEST DATA SHEET 7 (Sheet 2 of 2) Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

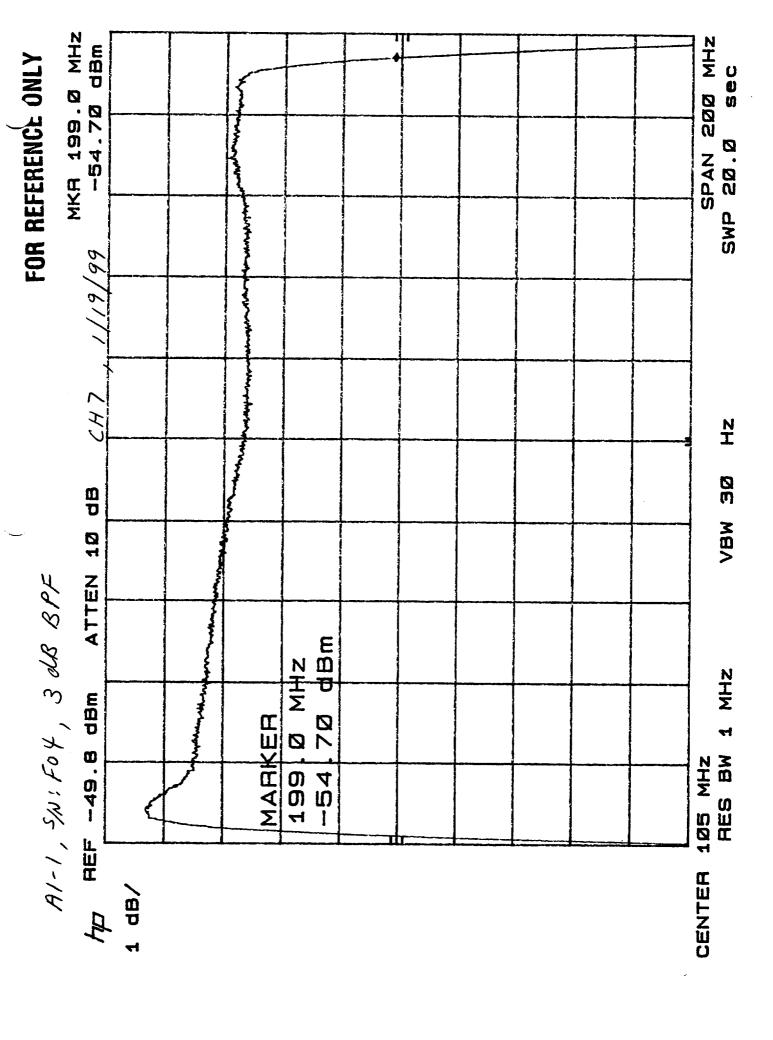
Component		Channel No.	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	40 dB BW Frequency (MHz)		40 dB BW Frequency (MHz)		Pass/Fail
					Lower	Higher	Required MAX (Ref Only)	Measured	
LO		6	9.97	187.3	2.3	221.0	520	218.7	P
		7	9.93	187.9	2.0	221.5	520	219.5	P
	LO	9	Positive		2.2	179.4	429	177.2	P
ĺ	No.	10	+15.13	527.3	170.4	264.4	101	94.0	P
	1	11	113110	52,13	N/A	N/A	47	N/A	NA
		12	Negative		N/A	N/A	21	N/A	N/A
		13	-15.13	-64.4	N/A	N/A	10	N/A	N/A
		14			N/A	N/A	4	N/A	N/A
	LO	9	Positive		2.0	179.6	429	177.6	P
-	No.	10	+15.13	537.6	170.4	264.4	101	94.0	P
	2	11	17,7,70		NA	N/A	47	N/A	N/A
		12	Negative		N/A	N/A	21	N/A	N/A
		13	-15.13	-70.5	N/A	N/A	10	N/A	N/A
•		14	,		N/A	N/A	4	N/A	N/A
·		15	14.88	183.6	N/A	N/A	7800	N/A	N/A
Mixer/Amps		All							
. IF Amps		All							

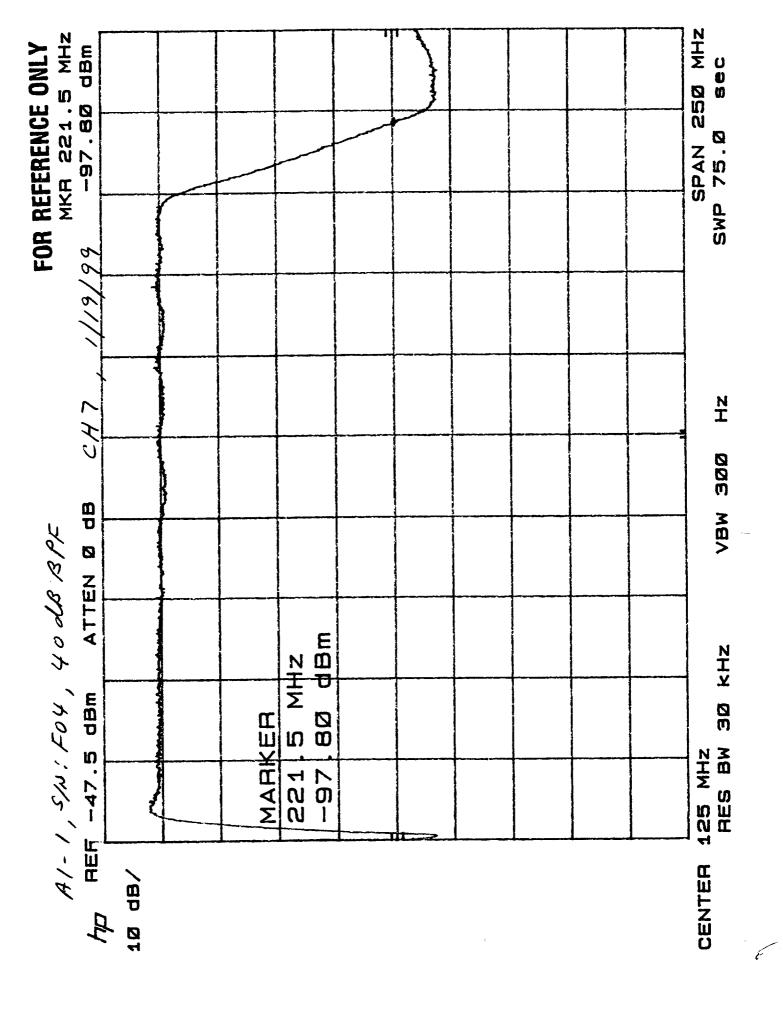
Part No.: 1356429-1	Test Engineer. 7. Vrich				
Serial No.: For	Quality Assurance: (268) Jun 92 '99				
	Date: 1/19/99				

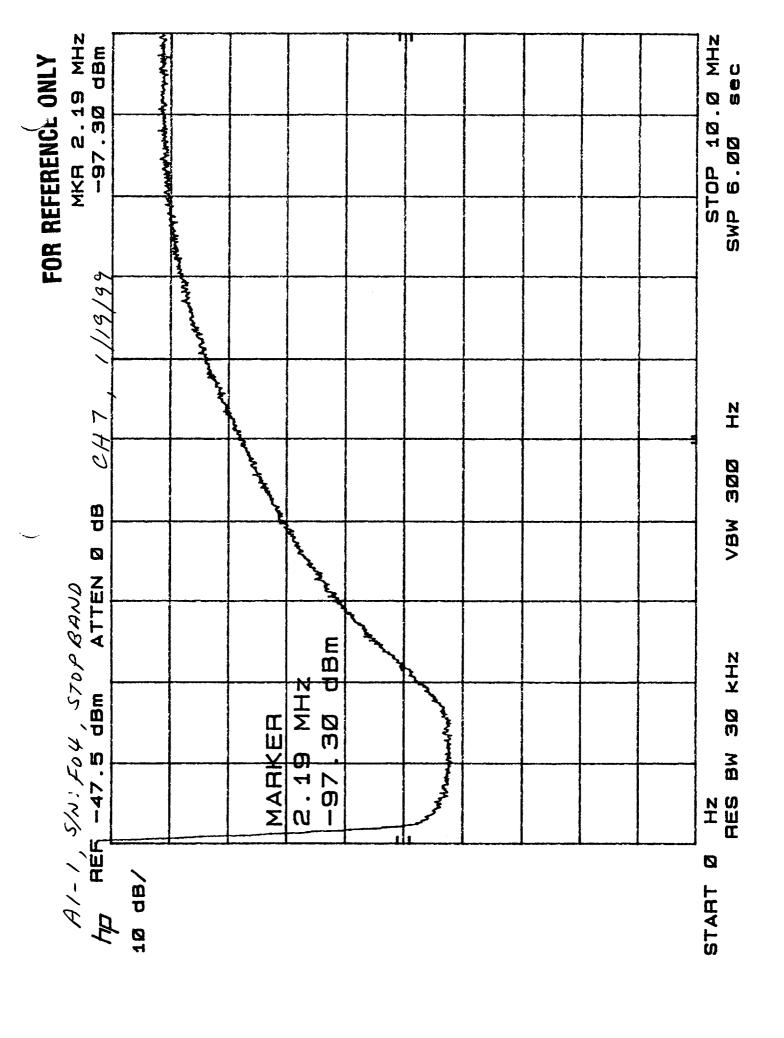


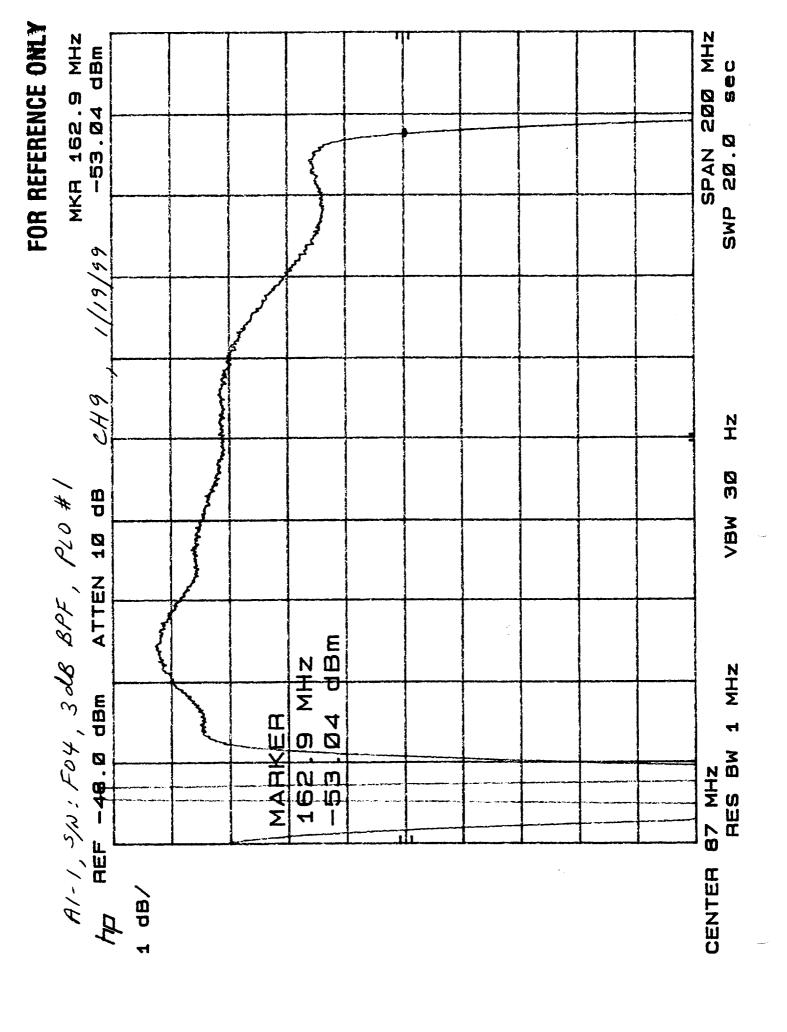


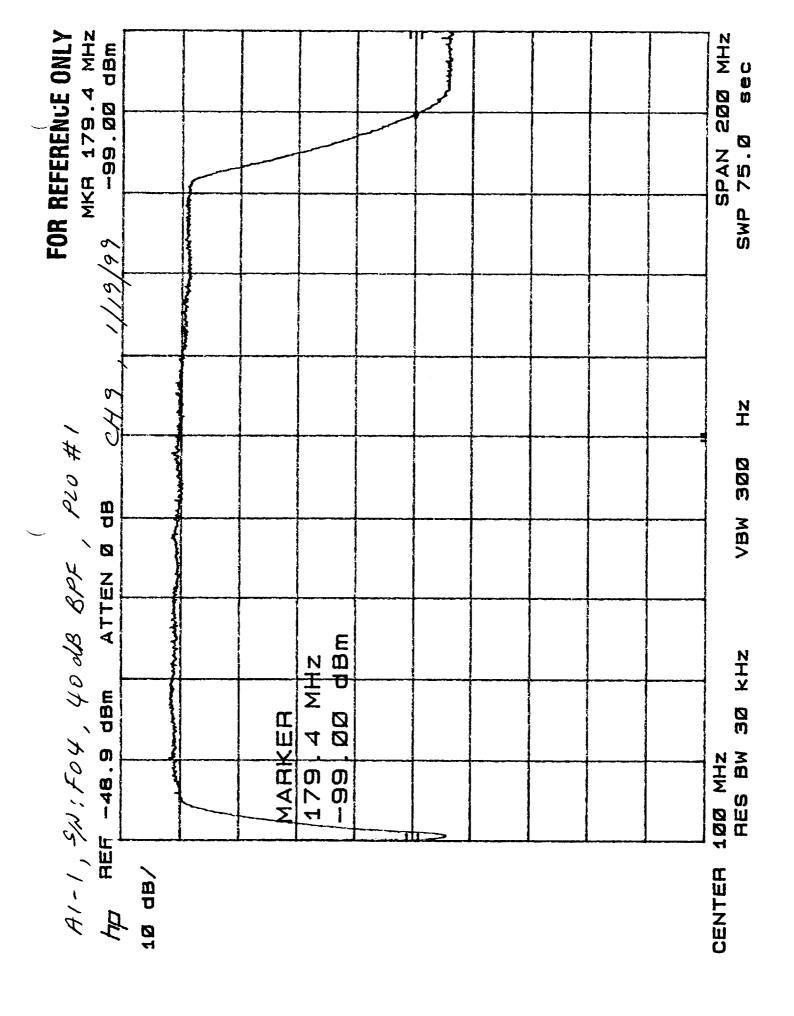


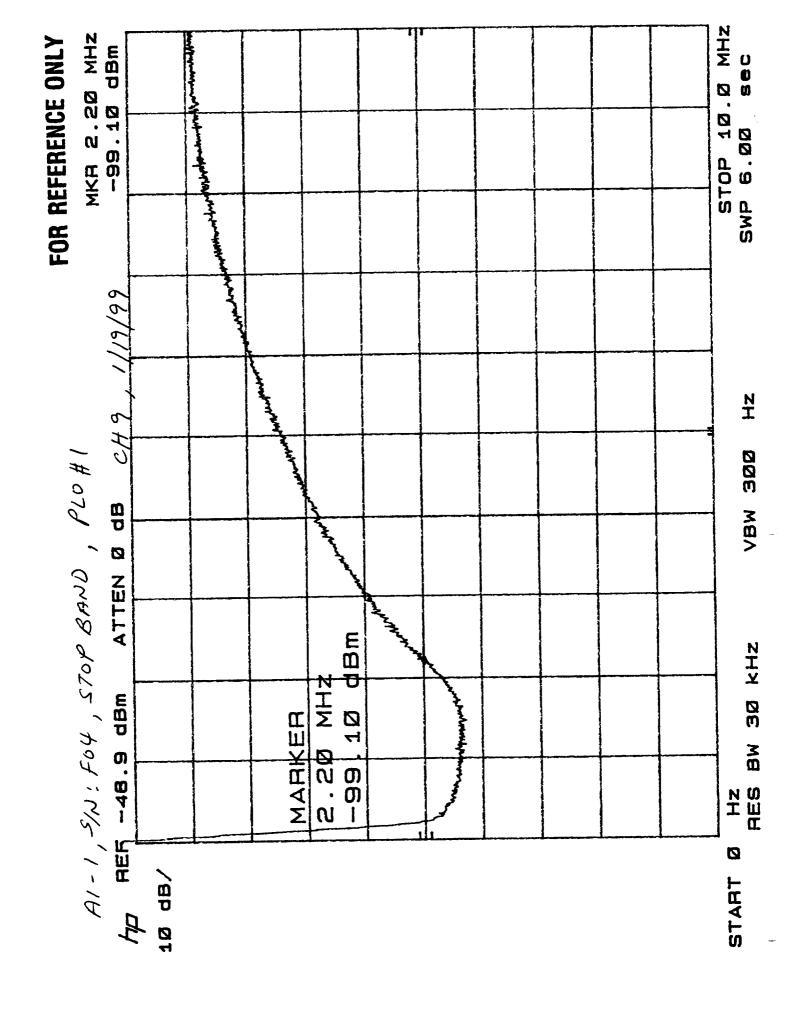


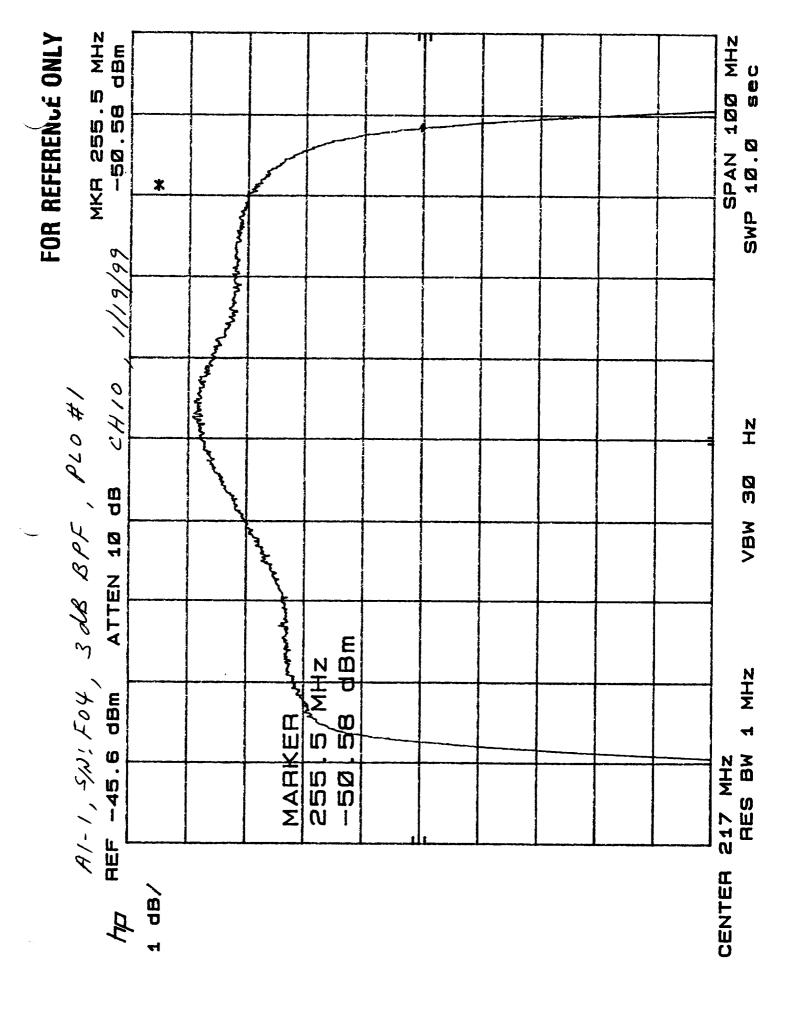


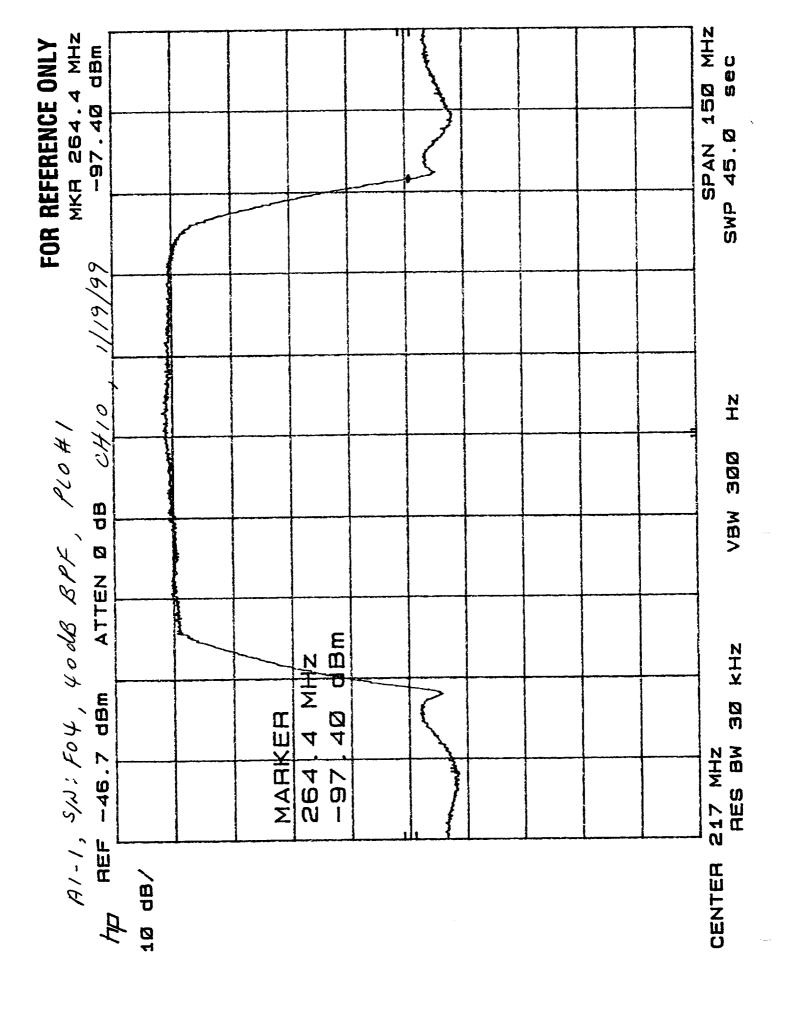


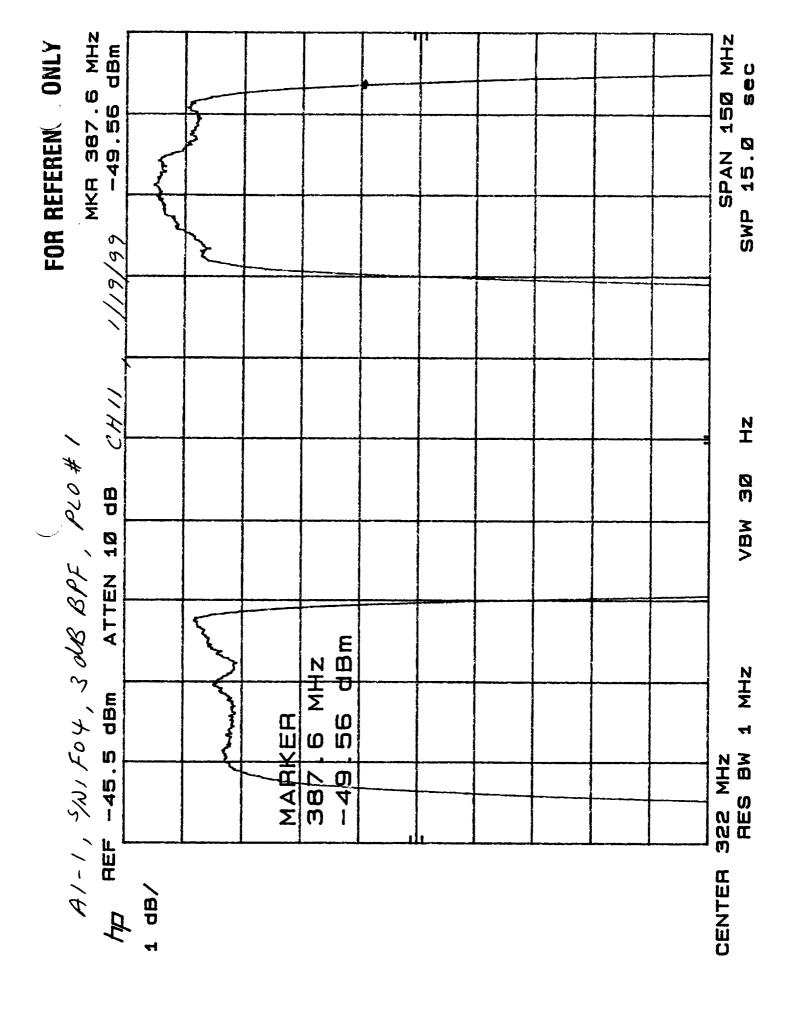


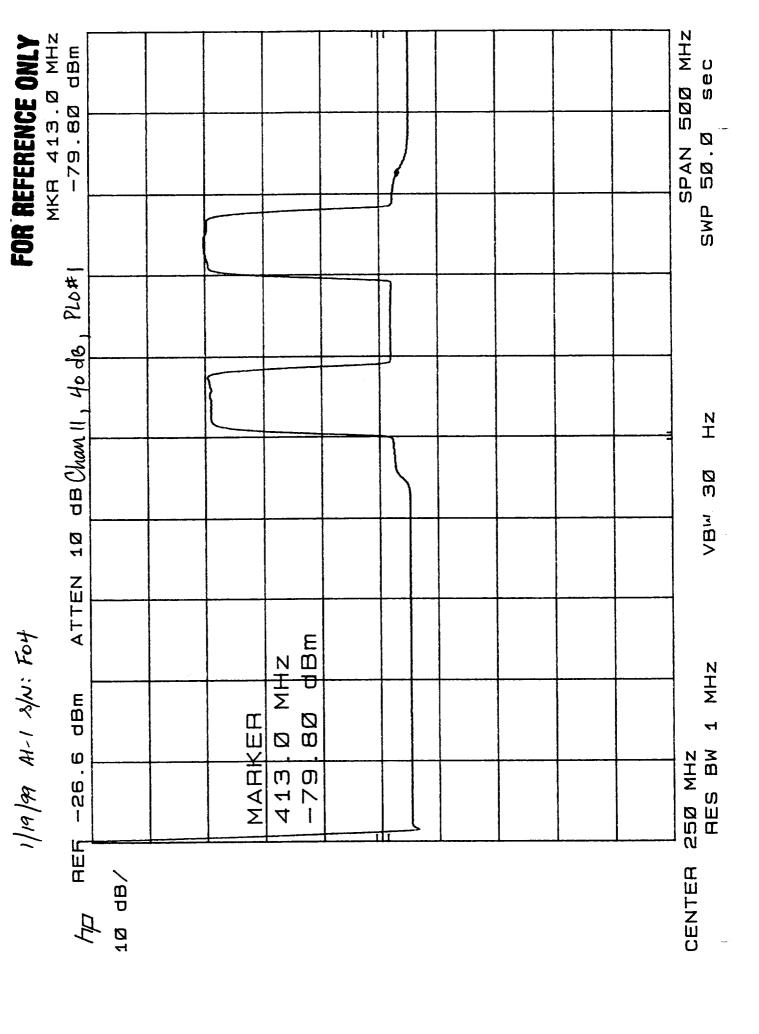


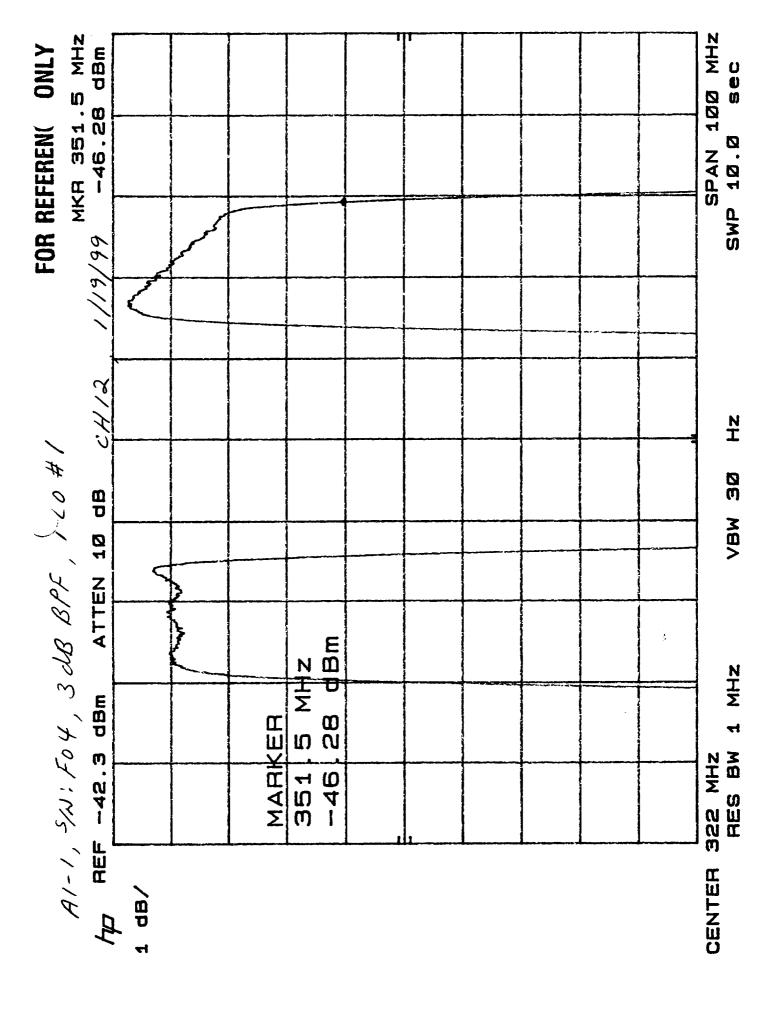


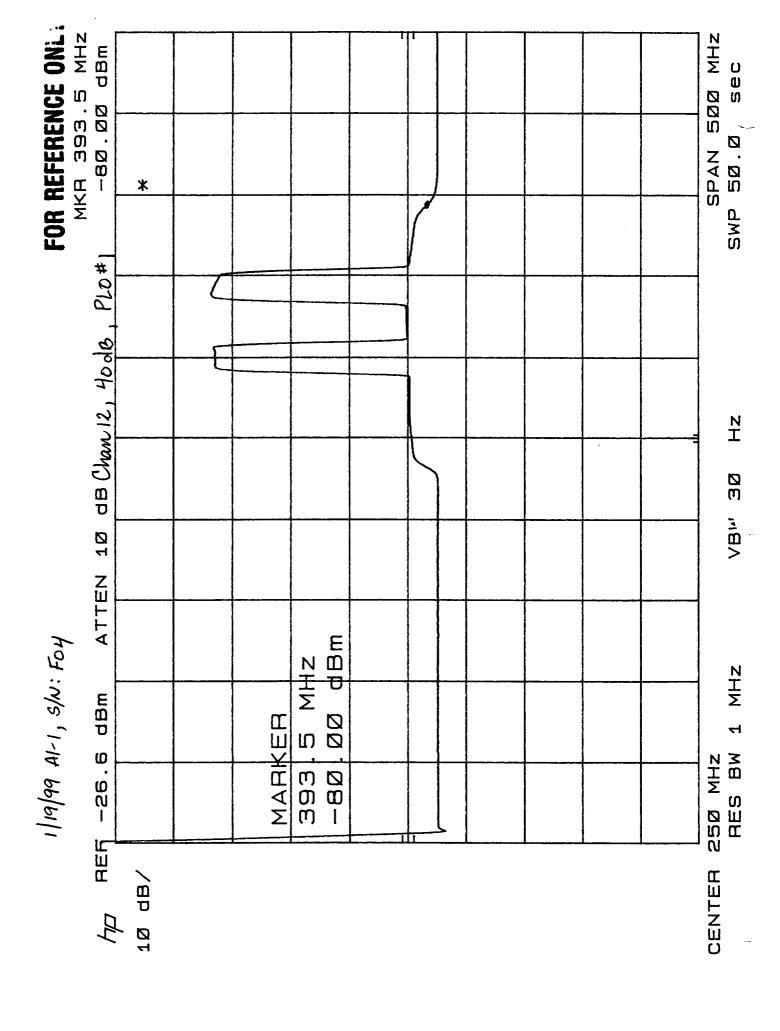


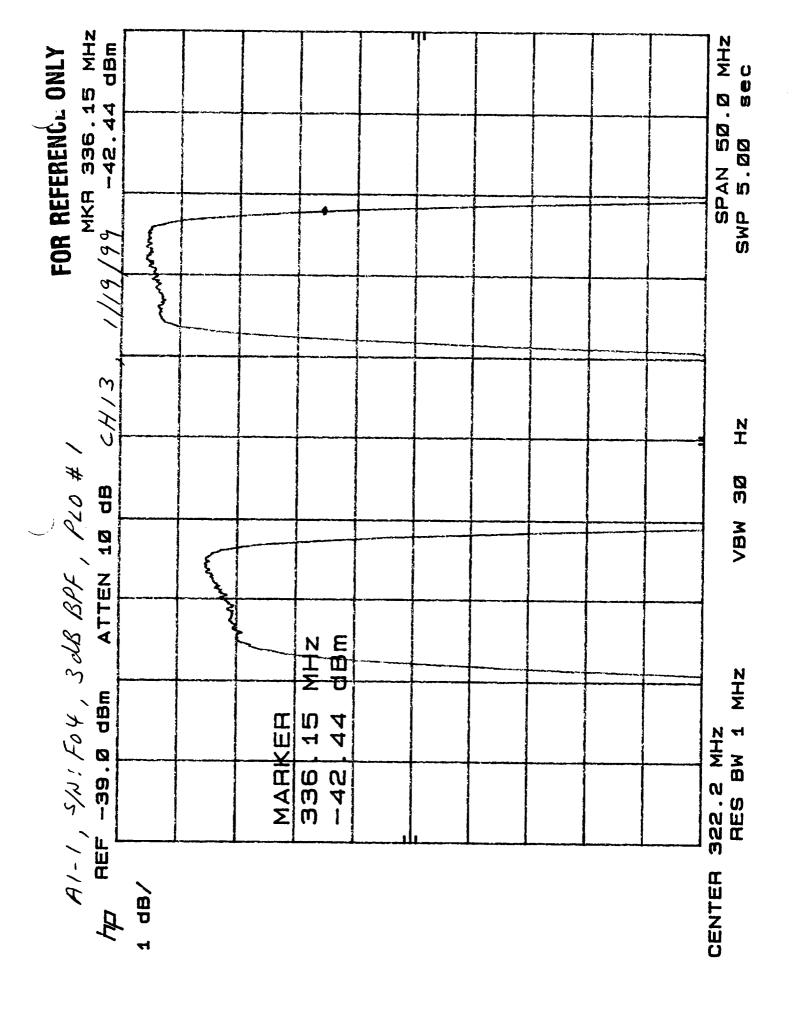


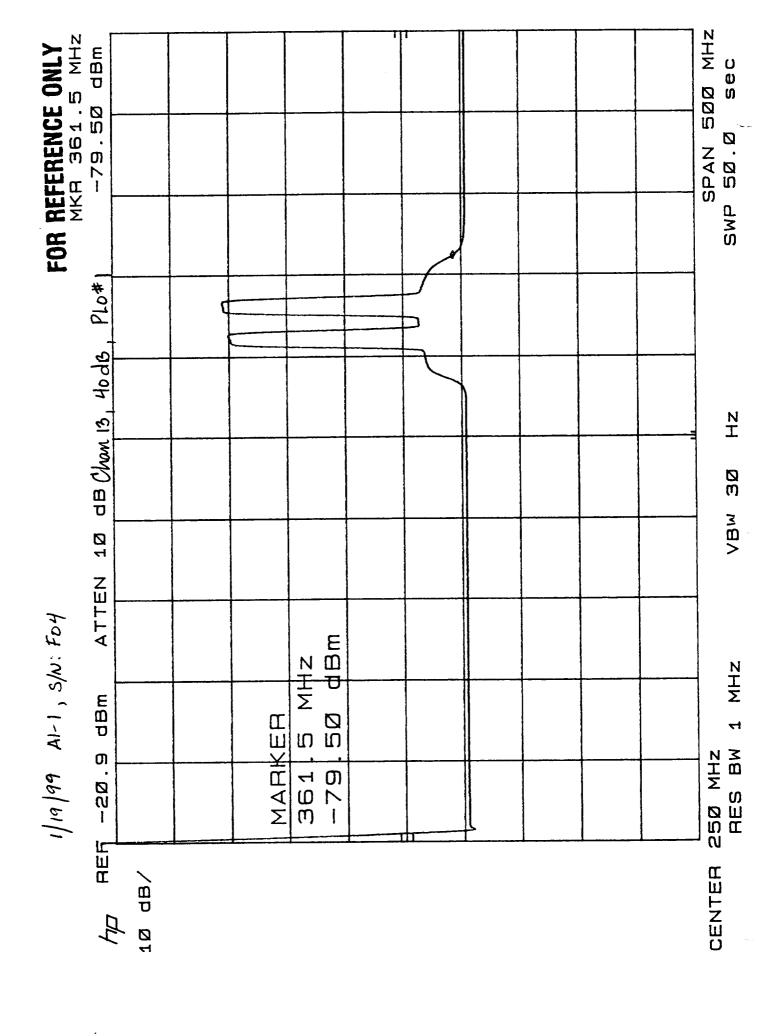


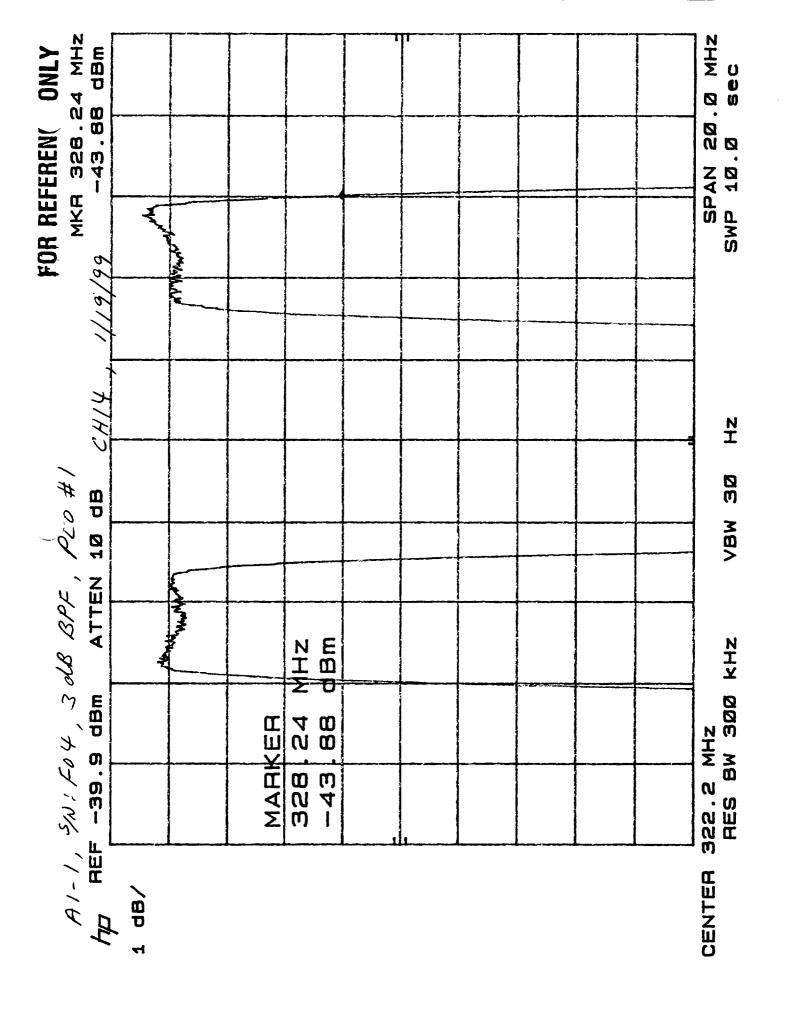


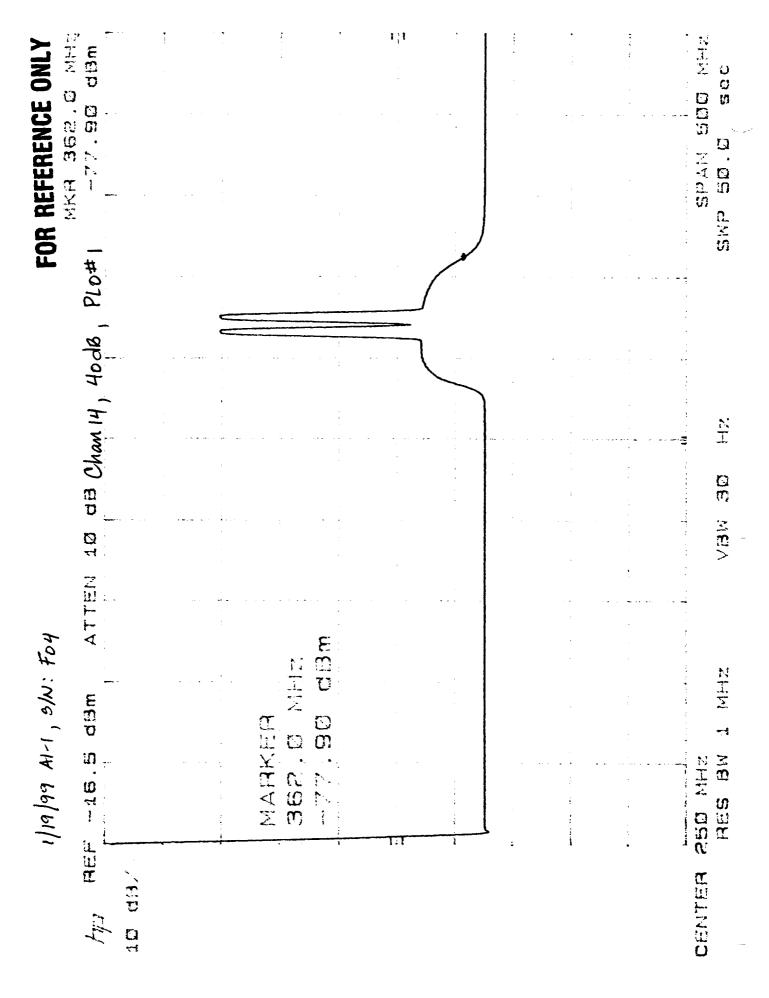


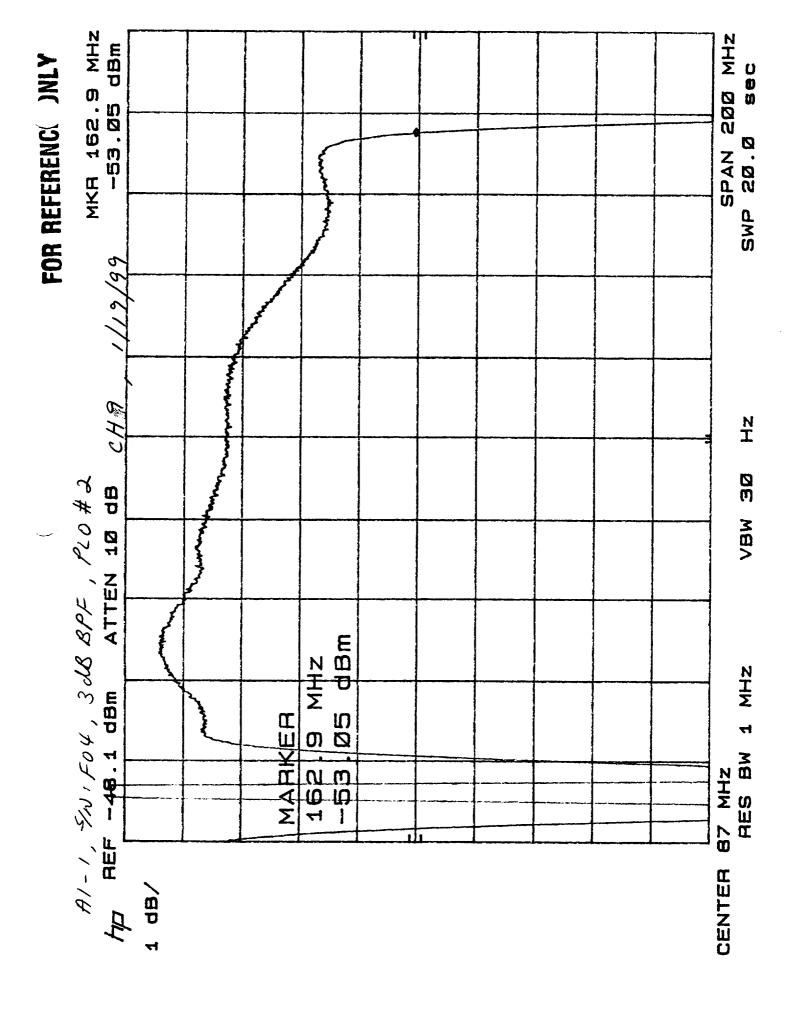


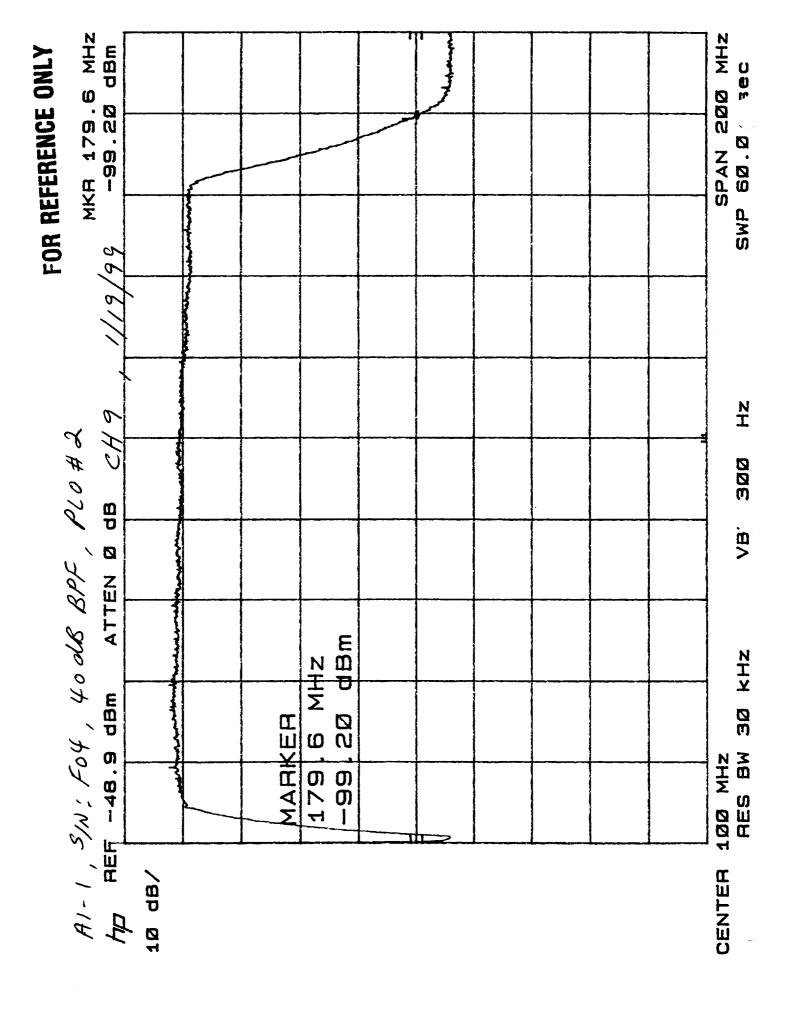


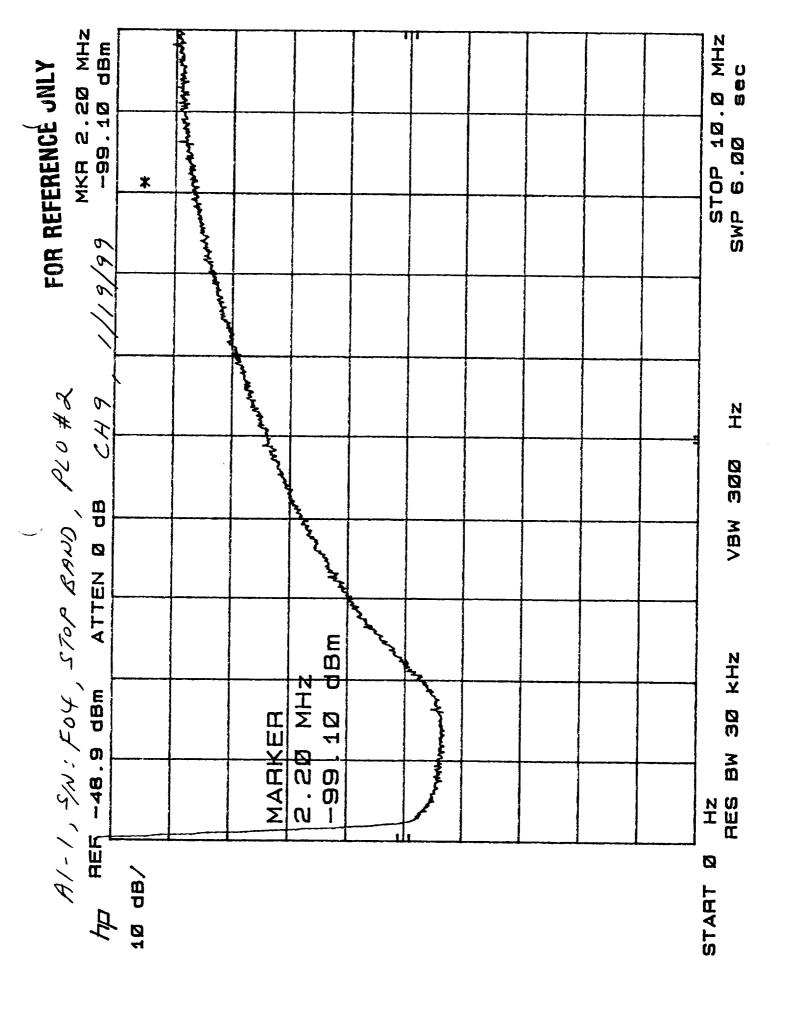


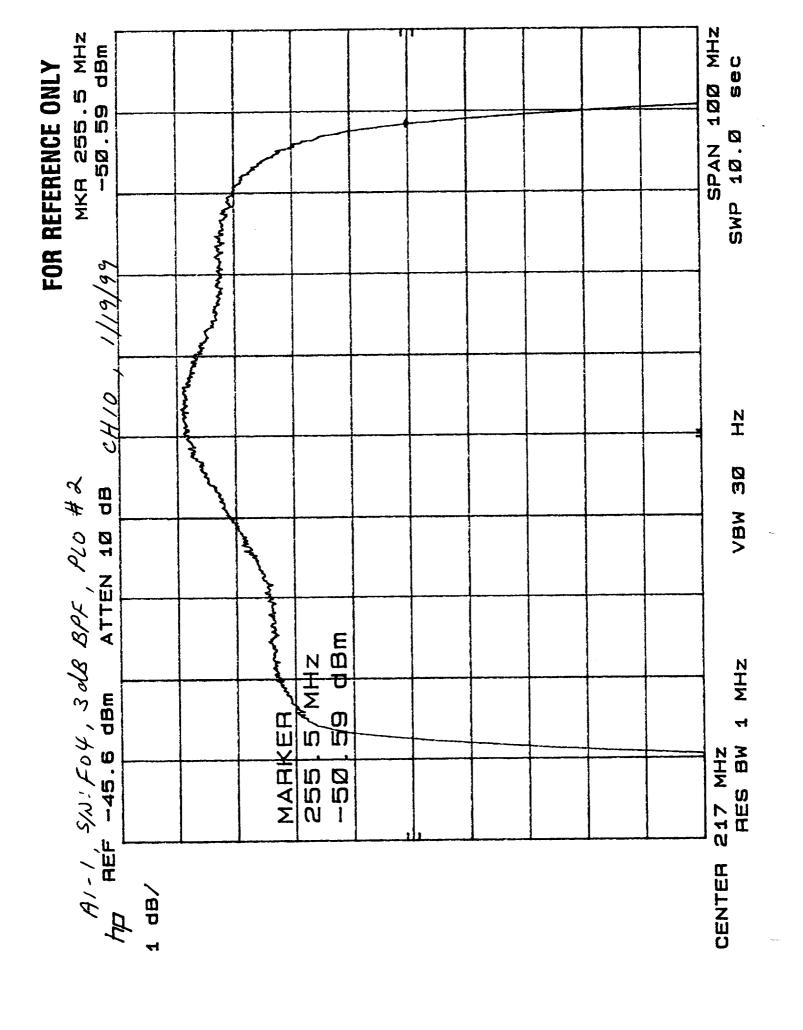


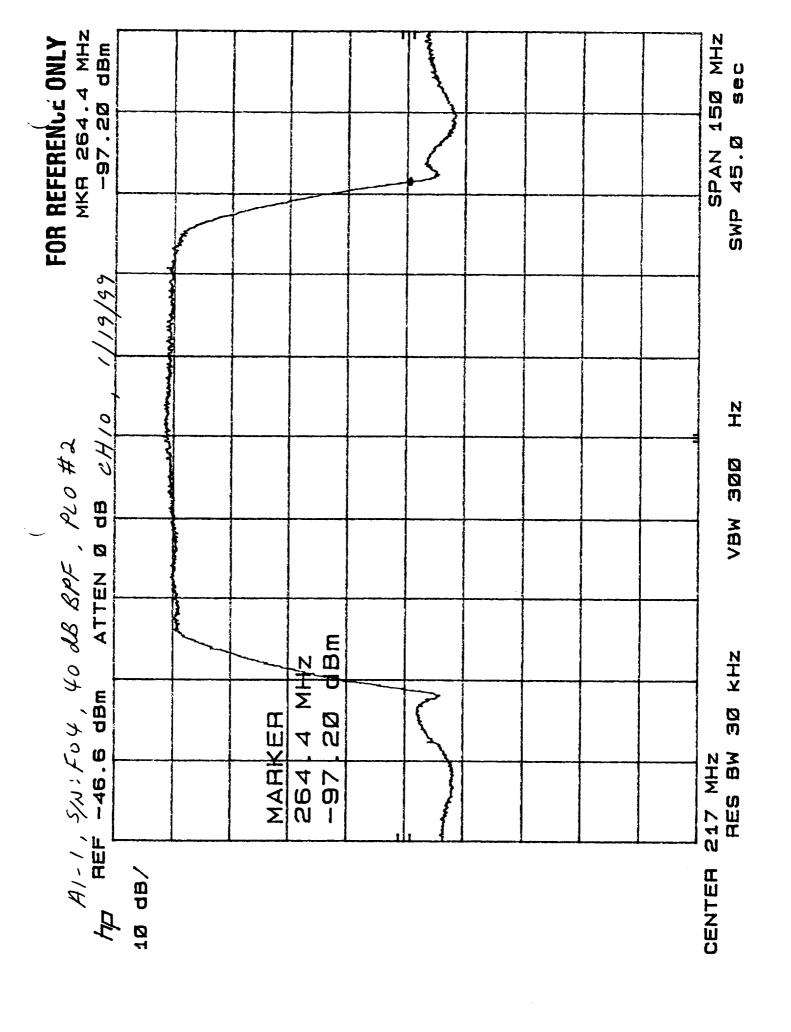




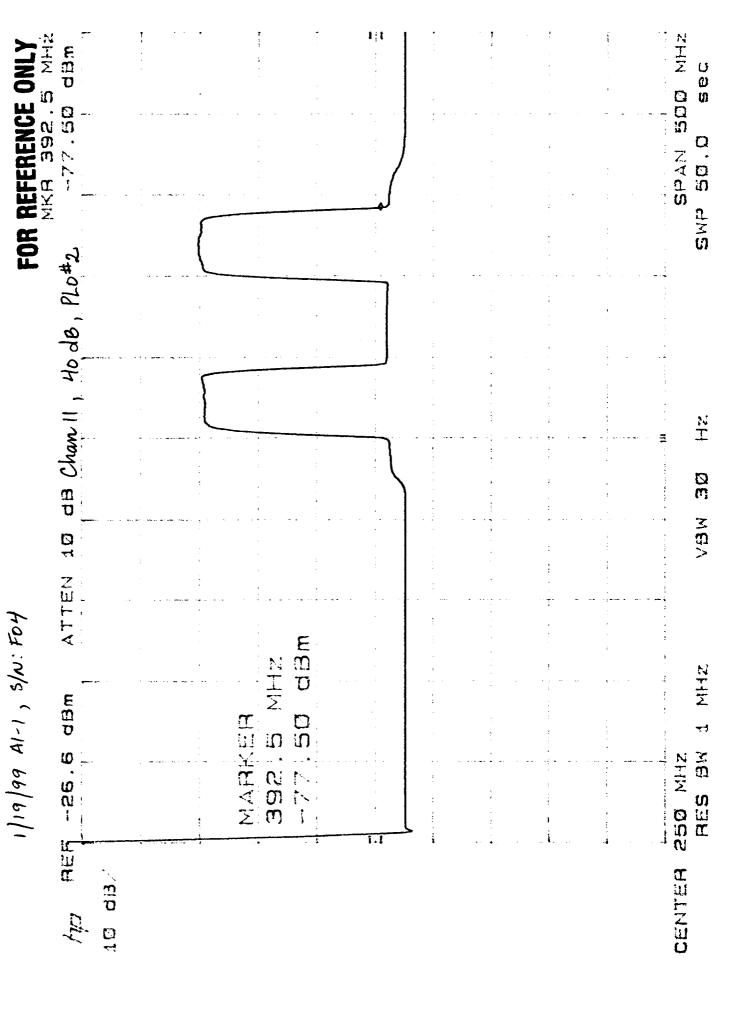


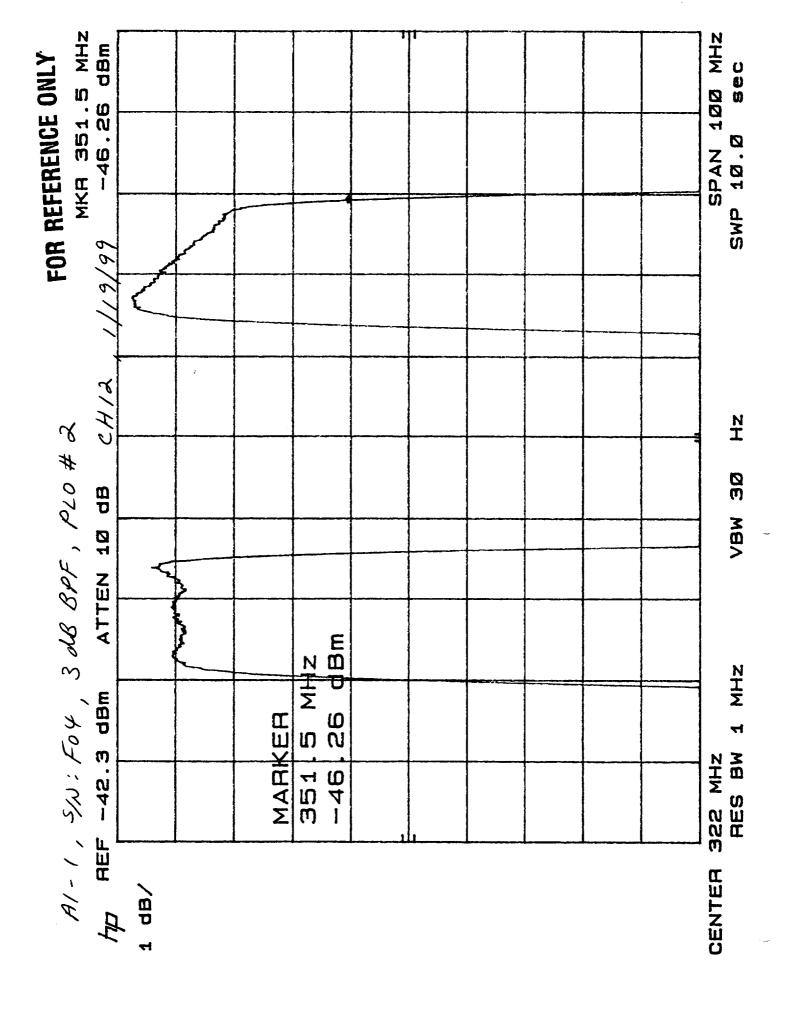


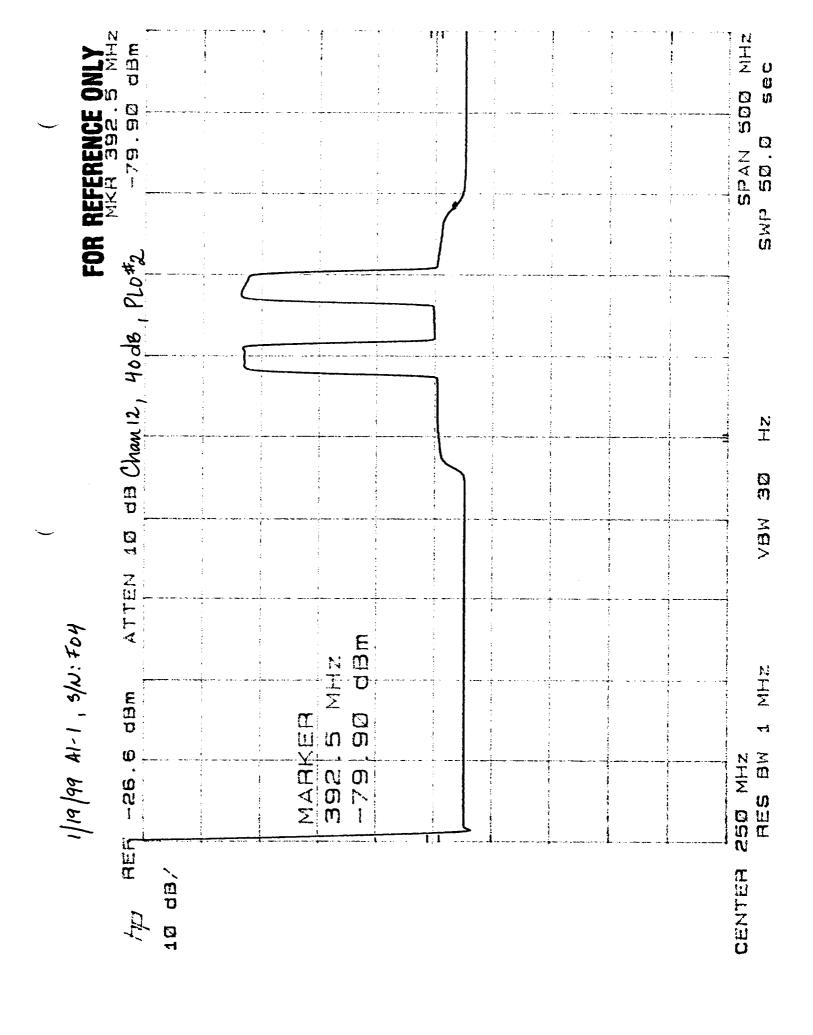


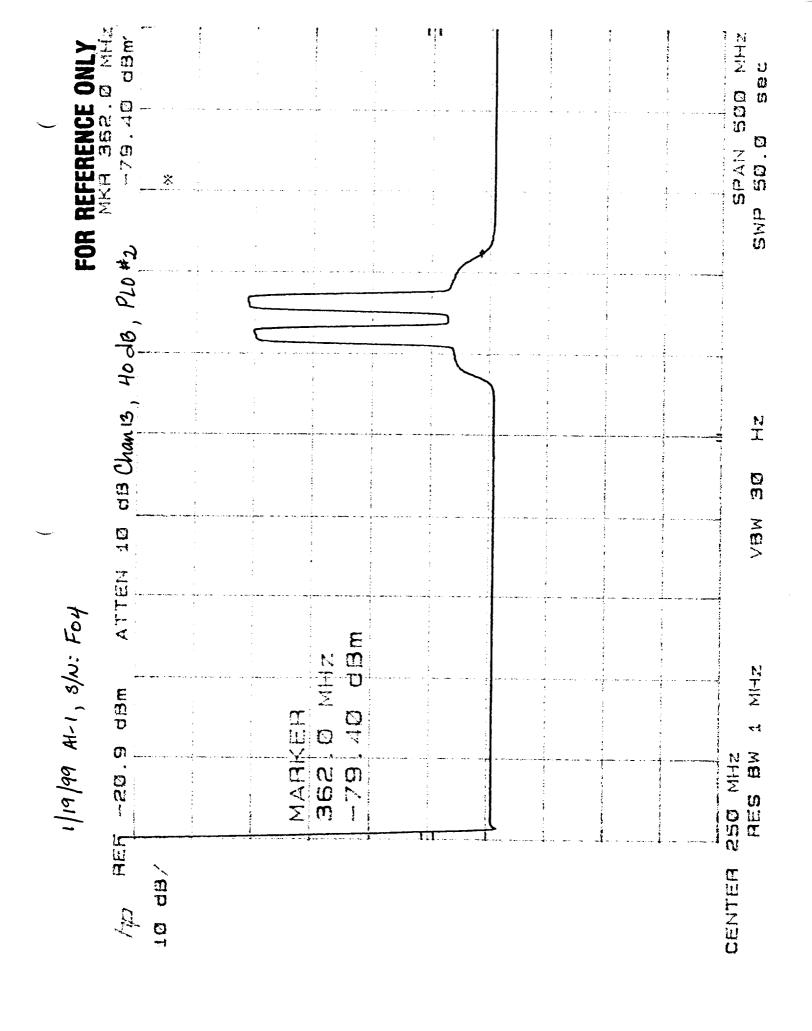


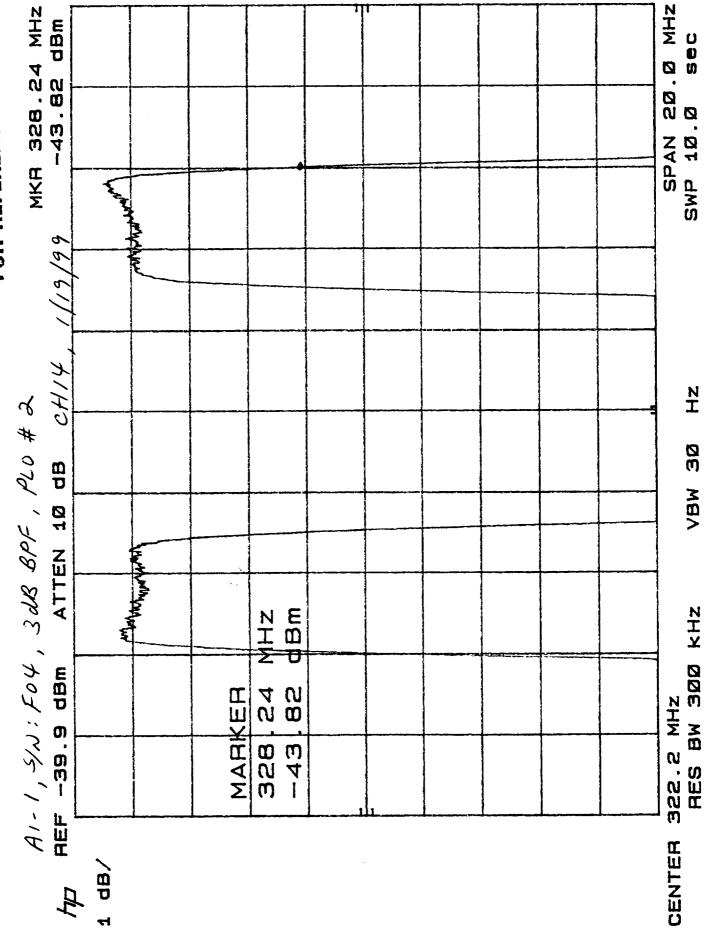
S & C SWP 15.0 H VBW 30 ΣIN HEF -45.5 dBm M M HES CENTER 1 dB/



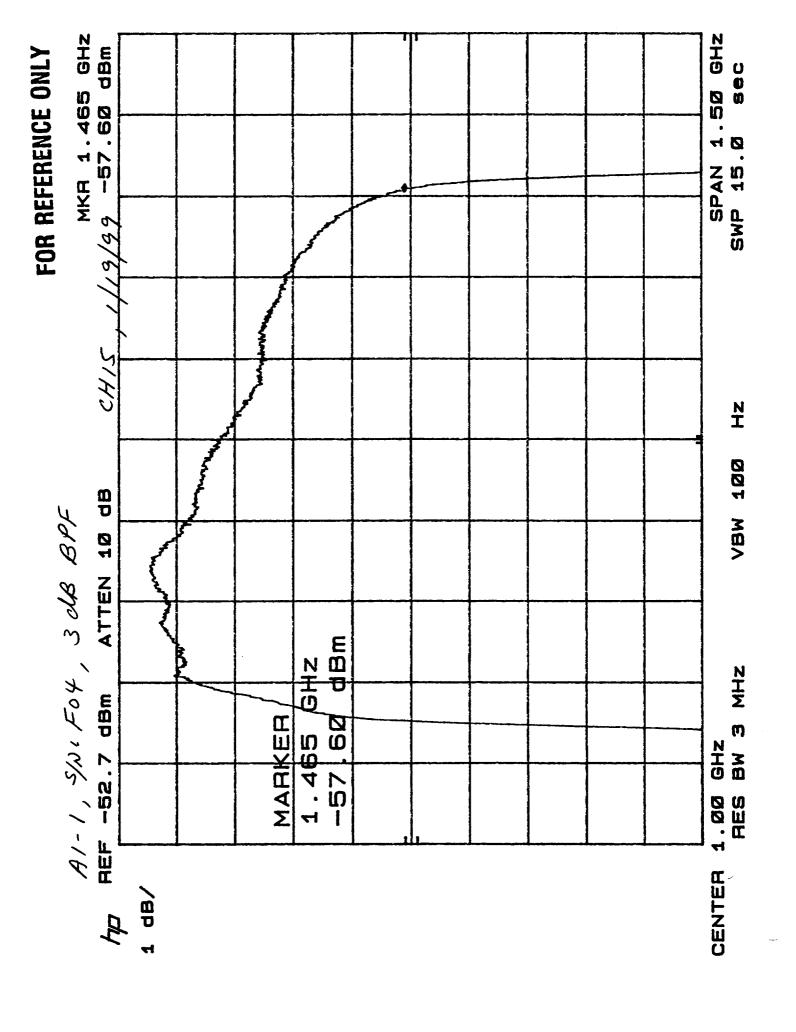


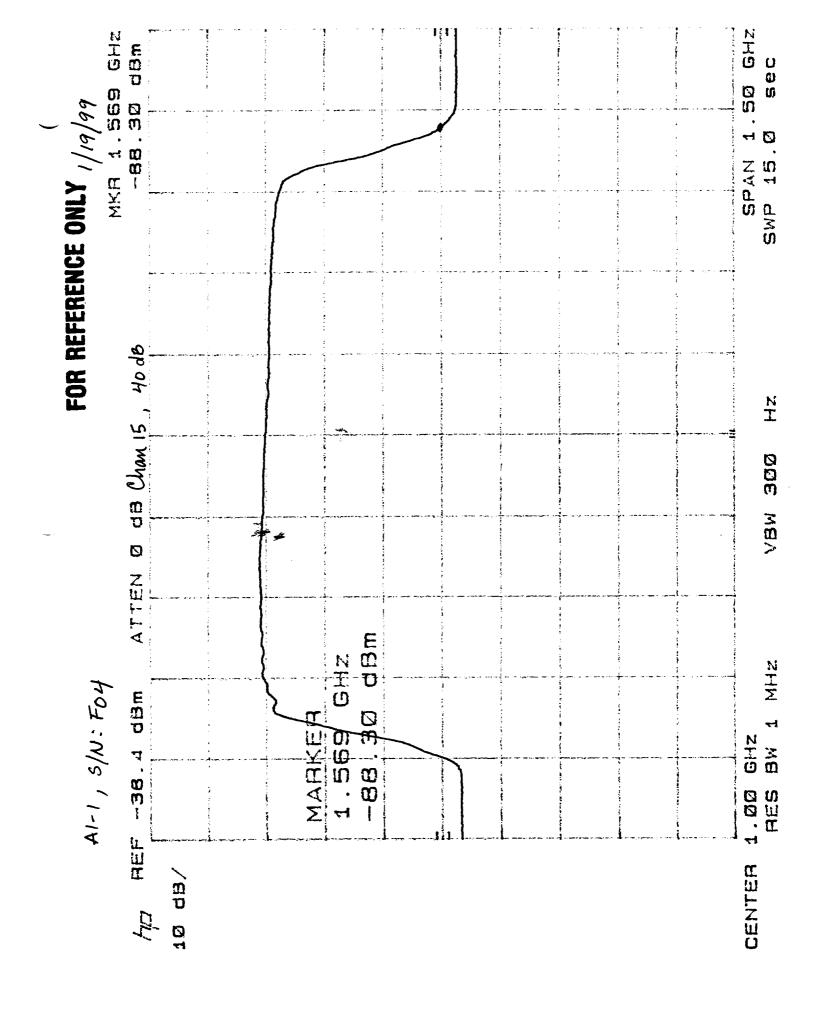


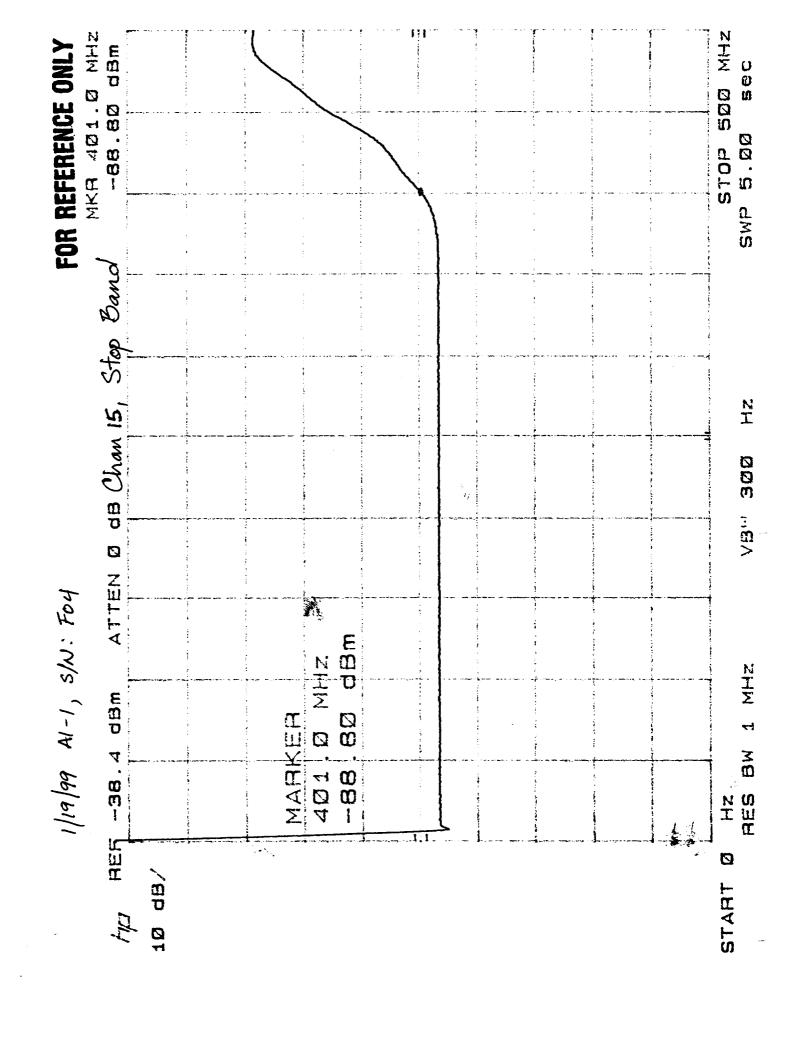




1/19/99 AI-1, S/N: FOY







# TEST DATA SHEET 10 (Sheet 1 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 7. 12 Baseplate Temperature (T<sub>B</sub>) 29.0 °C Signature

Compo-	Channel	V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub> (V)		T <sub>C</sub> (°C)	V <sub>C</sub>	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
				22.0	-9822	.000197	-194.0	72/3	.000180
				22.0	-9817	.000185	-194.0	-7214	.000150
		9.97		22.0	-9813	.000 193	-194.0	-7209	.000131
			187.3	22.0	-9811	.000203	-194.0	7209	.000171
LO	6			22.0	-9809	.000192	-194.0	7211	.00015
				22.0	-9808	.000169	-194.0	7212	.000152
				22.0	-9808	.000 184	-194.0	7206	.000176
				22.0	-9807	.000209	-194.0	-7209	.000157
				220	-9804	.000191	-194.0	-7204	.000/65
				22.0	-9804	.000196	-194.0	-7203	.000139
Mixer/ Amps	All	9.94	244.5						
IF Amps	All	7.94	268.1						

Part No.: 1356429-/	Test Engineer: 7. Link
Serial No.: Fo 4	Quality Assurance: (74) 28 99
	Date:

#### TEST DATA SHEET 10 (Sheet 16 of 30)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setu	Test Setup Verified: Y. Vrinh Basept Signature					ate Temperature (T <sub>B</sub> ) <u>29.0</u> °C				
		NF (	dB)		NPS (K)					
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail	
6		4.45				0.076				
		4.46		建筑		0.052				
		4.45	1486			0.069				
		4.46				0.086				
		4.46				0.068				
		4.47				0.034				
		4.46				0.049				
		4.46				0.096				
		4.46				0.065				
		4.46				0.075				
	5.15		4.46	Pars	.08		0.067	0.062	Pass	
								Pass = P,	Fail = F	
Part No.: 1356429-1 Test Engineer: 7. 2316										
Part No.: /356429-/ T  Serial No.: Fo 4.					Test Engin	eer:	(74)			
Serial No	).: <i>i</i>	104.		<del></del>			(268) A	N 22		
					Date:	1/19/9	'9			

## FOR REFERENCE ONLY

#### AMSU-A TEST

A1-1, S/N: F04, CH6, NF & NPS DATA, TB=29 C, 1/19/99

SEQ	TEMP_	TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM '	TEST	295.15	98217913	.00019718		
2	COLD	TEST	79.15	72128743	.00018015	4.45026965	.07644458
3	WARM '	TEST	295.15	98169856	.00018498		
4	COLD '	TEST	79.15	72138225	.00015006	4.45778072	.05175531
5	WARM	TEST	295.15	98125995	.00019313		
5	COLD	TEST	79.15	72087939	.00013113	4.45474891	.06940050
7	WARM T	TEST	295.15	98108205	.00020261		
8	COLD	TEST	79.15	72090035	.00017074	4.45729565	.08612225
9	WARM	TEST	295.15	98094113	.00019221		
10	COLD	TEST	79.15	72108981	.00015053	4.46222106	.06786527
11	WARM	TEST	295.15	98084742	.00016915		
12	COLD	TEST	79.15	72124655	.00015234	4.46501798	.03392415
13	WARM	TEST	295.15	98077229	.00018387		
14	COLD	TEST	79.15	72056637	.00017012	4.45550863	.04937263
15	WARM T	TEST	295.15	98066227	.00020898		
16	COLD	TEST	79.15	72089959	.00015691	4.46246948	.09629580
17	WARM 7	TEST	295.15	98042905	.00019089		
18	COLD	TEST	79.15	72035082	.00016474	4.45612409	.06535363
19	WARM T	TEST	295.15	98041874	.00019597		
20	COLD	TEST	79.15	72034021	.00013910	4.45607306	.07501606

CH. 6 ,192.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.45785306607

NOISE POWER STABILITY (K) = .0671550194977

NOISE POWER STABILITY DELTA (K) = .0623716540723

 $NPS_MAX (K) = .0962958048243 NPS_MIN (K) = .033924150752$ 

INTEGRATION TIME = .165

### TEST DATA SHEET 10 (Sheet 2 of 30)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	4. Vinh	Baseplate Temperature (T <sub>B</sub> ) 29.0 °C
	Signature	
	_	

Compo-	Channel	V <sub>b</sub> (V)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	VH	(V)	T <sub>C</sub> (°C)	ν <sub>c</sub>	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
				22.0	-9549	.000171	-194.0	-6638	000140
				22.0	-9548	.000164	-194.0	76632	.000150
				22.0	-9546	-000196	-194.0	-6632	-000/38
				22.0	:9547	.000169	-194.0	-6637	.000139
LO	7	9.93	187.9	22.0	-9548	.000/91	-194.0	-6629	.000144
				22.0	9548	.000190	-194.0	-6636	.000135
				22.0	-9544	.000219	-194.0	76632	.000211
-				22.0	-9544	.000174	-194.0	76640	.000143
				22.0	-9545	.000174	-194.0	-6632	.000154
				22.0	-9541	.000164	-194.0	-6640	.000/5/
Mixer/ Amps	All	9.94	244.5						
IF Amps	All	7.94	268.1						

Part No.: /356429-/	Test Engineer: Y. Vrinh
Serial No.:FOY	Quality Assurance: (7A)
	Date: 1/19/99

#### TEST DATA SHEET 10 (Sheet 17 of 30)

	.,	Noise Figur	e and Noise	Power Stabil	ity Test Data	a (Paragraph	3.5.4) (A1-1)	)			
Test Sett	up Verified:		<u>L</u> ature	Basepla	te Temperati	ire (T <sub>B</sub> ) <u>29</u>	<u>.o</u> •c				
	NF (dB)					NPS (K)					
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail		
7		3.85	-			0.018					
		3.84				0.031					
		3,84				0.073					
		3.85				0.007					
		3.84				0.064					
		3.85				0.063					
		3.84				0.103					
		3.86				0.029					
		3.84				0.027					
		3.85				0.033					
	5.15		3.85	Pass	.08		0.045	0.096	Pass		
								Pass = P,	Fail = F		
Part No.:_	/3	56429	-1			er: <u> </u>	_				
Serial No.	: <i>}</i>	-04		<del></del>		urance:	_	TH 53 .A	<del></del>		
					Date:	1/19/	99				

# FOR REFERENCE ONLY

AMSU-A TEST

A1-1, S/N: F04, CH7, NF & NPS DATA, TB=29 C, 1/19/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	95491893	.00017141		
2	COLD TEST	79.15	66380651	.00014034	3.84793308	.01811970
3	WARM TEST	295.15	95476302	.00016439		
4	COLD TEST	79.15	66320572	.00014987	3.84053822	.03098816
5	WARM TEST	295.15	95464500	.00019609		
6	COLD TEST	79.15	66319541	.00013807	3.84161401	.07293375
7	WARM TEST	295.15	95470803	.00016939		
8	COLD TEST	79.15	66371674	.00013936	3 <b>.84</b> 878743	.00660552
9	WARM TEST	295.15	95475314	.00019056		
10	COLD TEST	79.15	66293378	.00014425	3.83656259	.06427281
11	WARM TEST	295.15	95475732	.00019000		
12	COLD TEST	79.15	66357020	.00013512	3.84607011	.06348874
13	WARM TEST	295.15	95442901	<b>√</b> 00021913		
14	COLD TEST	79.15	66316868	.00021191	3.84346576	.10293127
15	WARM TEST	295.15	95444482	.00017397		
16	COLD TEST	79.15	66402812	.00014302	3.85622792	.02891605
17	WARM TEST		95446243	.00017355		
18	COLD TEST		66316612	.00015445	3.84307868	.02739131
19	WARM TEST	. –	95465280	.00016357		
20	COLD TEST		66400907	.00015064	3.85376265	.03333611
20	2222 ,20,					

CH. 7 ,192 MHz MHz

NOISE FIGURE AVERAGE (dB) = 3.84580783281

NOISE POWER STABILITY (K) = .0448983424104

NOISE POWER STABILITY DELTA (K) = .0963257478551

 $NPS_MAX(K) = .102931269688 NPS_MIN(K) = .00660552183272$ 

INTEGRATION TIME = .165

# TEST DATA SHEET 10 (Sheet 3 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	7. Trinh	Baseplate Temperature (T <sub>B</sub> ) 28.0 °C	PLO No. 1
	Signature		

Compo- Channe		V <sub>b</sub> (V)	I <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	V <sub>C</sub>	V <sub>c</sub> (V)	
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation	
	·	Posi- tive		22.0	-1.118	.000234	-194.0	-8105	.000187	
		+15.13	527.3	22.0	-1.117	.000235	-194.0	-, 8091	.000 159	
,		Negative		22.0	-1.117	.000235	-194.0	-8093	.000229	
				22.0	-1.116	.000260	-194.0	8084	.000168	
ro	9			22.0	-1.116	.000229	-194.0	8072	.000172	
			-64.4	22.0	-1.116	.000228	-194.0	8063	.000/81	
				22.0	-1.115	.000259	-194.0	808/	-000192	
	_			22.0	-1.115	.000247	-194.0	8072	.000223	
				22.0	-1.115	.000263	-194.0	-8068	.000/95	
				22.0	-1.114	.000234	-194.0	8061	.000234	
Mixer/ Amps	Ali	9.93	244.4							
IF Amps	All	7.95	267.9							

Part No.: 1356429 - 1	Test Engineer: <u>9</u>	Grins
Serial No.: FO4	Quality Assurance:	(892) 1M 22 99
	Date: 1/20/9	99

TEST DATA SHEET 10 (Sheet 18 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setu	p Verified:_	Y. Z Signa		Baseplat	e Temperatu	re (T <sub>B</sub> ) <b>28</b>	<u>°.ø_</u> °C F	PLO No. 1	
		NF (	dB)		NPS (K)				
Channel No.	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
9		4.30				0.052			
		4.29				D. D55			
		4.30				0.056			
		4.28				0.095			
		4.27				0.041			
		4.26				D. 036			
		4.29				0.094			
		4.28				0.078			
		4.28				0.10			
		4.27				0.055			
	4.7		4.28	Pass	.08		0.066	0.064	Pass
								Pass = P,	Fail = F
							1		
		6429	-/		Test Engine	eer:	7. 28 ind (74) (268)	MH 55 20	
Serial No	::	-04		<del></del> _	Quality Ass	surance:	100	ли "	
		* * * * * * * * * * * * * * * * * * * *			Date:	1/20	·/44		

# FOR REFERENCE ONLY

#### AMSU-A TEST

A1-1, S/N: F04, CH9, PLO #1, NF & NPS DATA, TB=28 C, 1/20/99

SEQ	TEMP_TEST	TEST TEM	P VOLTAGE	STD_OEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.11750210	.00023373		
2	COLD TEST	79.15	81053300	.00018717	4.30355731	.05180401
3	WARM TEST	295.15	-1.11693235	.00023507		*
4	COLD TEST	79.15	80911380	.00015892	4.28924732	.05479231
5	WARM TEST	295.15	-1.11664461	.00023532		
6	COLD TEST	79.15	80933921	.00022878	4.29541478	.05551623
7	WARM TEST	295.15	-1.11638862	.00025958		
8	COLD TEST	79.15	80841930	.00016792	4.28497788	.09480005
9	WARM TEST	295.15	-1.11614168	.00022935		
10	COLD TEST	79.15	80723534	.00017192	4.27072960	.04142532
11	WARM TEST	295.15	-1.11590156	.00022755	~~~~~~	
12	COLD TEST	79.15	80628368	.00018135	4.25973041	.03632097
13	WARM TEST	295.15	-1.11536411	.00025877		
14	COLD TEST	79.15	80807730	.00019204	4.29066331	.09414654
15	WARM TEST	295.15	-1.11493984	.00024745		
16	COLD TEST	79.15	80723663	.00022304	4.28308011	.07768764
17	WARM TEST	295.15	-1.11480871	.00026314		
18	COLD TEST	79.15	80678432	.00019466	4.27800497	.09983266
19	WARM TEST	295.15	-1.11443113	.00023455		
20	COLD TEST	79.15	80607751	.00023392	4.27185391	.05458948

CH. 9 ,153.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.28274344382

NOISE POWER STABILITY (K) = .0660915215585

NOISE POWER STABILITY DELTA (K) = .0635116882923

 $NPS_MAX(K) = .0998326583991$   $NPS_MIN(K) = .0363209701068$ 

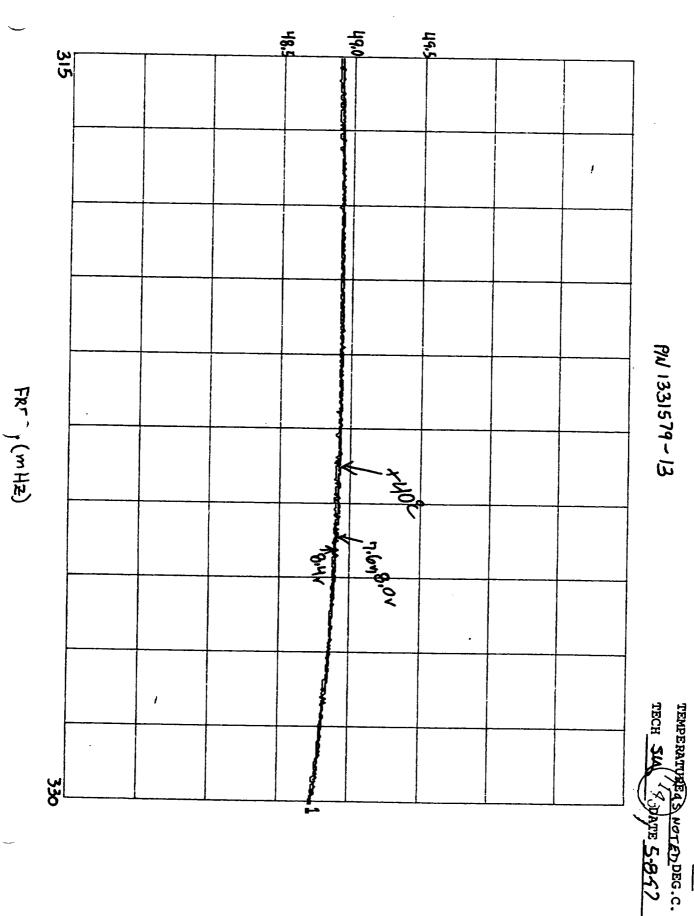
INTEGRATION TIME = .165

# TEST DATA SHEET 10 (Sheet 4 of 30) Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified:	9. Vrinds Signature	Baseplate Temperature (T <sub>B</sub> ) <u>29.0</u> °C	PLO No. 1	,
----------------------	------------------------	--------------------------------------------------------	-----------	---

Compo-	Channe!	V <sub>b</sub> (V)	l <sub>b</sub> (mA)	T <sub>H</sub> (°C)	V <sub>H</sub>	(V)	T <sub>C</sub> (°C)	Vc	(V)
nent	No.				Mean	Standard Deviation		Mean	Standard Deviation
		Posi- tive		22.0	-9299	-000275	-194.0	6657	.000228
		+15.13	+15.13 527.3	22.D	-9298	.000304	-194.0	-6647	.00204
		155		22.0	9298	£00287	-194.0	-6658	.000179
				22.0	-9298	.000256	-194.0	-6654	.000196
LO	10	Nega- tive		22.0	-,9293	.000268	-194.0	6651	.000 193
				22.0	-9293	.000246	-194.0	-6652	.000 180
		-15.13	-64.4	22.0	-9293	.000306	-194.0	6653	.000 194
			01.7	22.0	9298	.000294	-194.0	-6659	.000/85
				22.0	-9295	.000296	-194.0	-6653	.000216
,				22.0	-9298	.000282	-194.0	6658	.000239
Mixer/ Amps	All	9.93	244.4						
IF Amps	Ali	7.95	267.9						

Part No.:	1356429-1	Test Engineer: Y- Vrul
Serial No.:	Fo4	Quality Assurance: (893) JIN 28 '99
		Date: 1/20/99

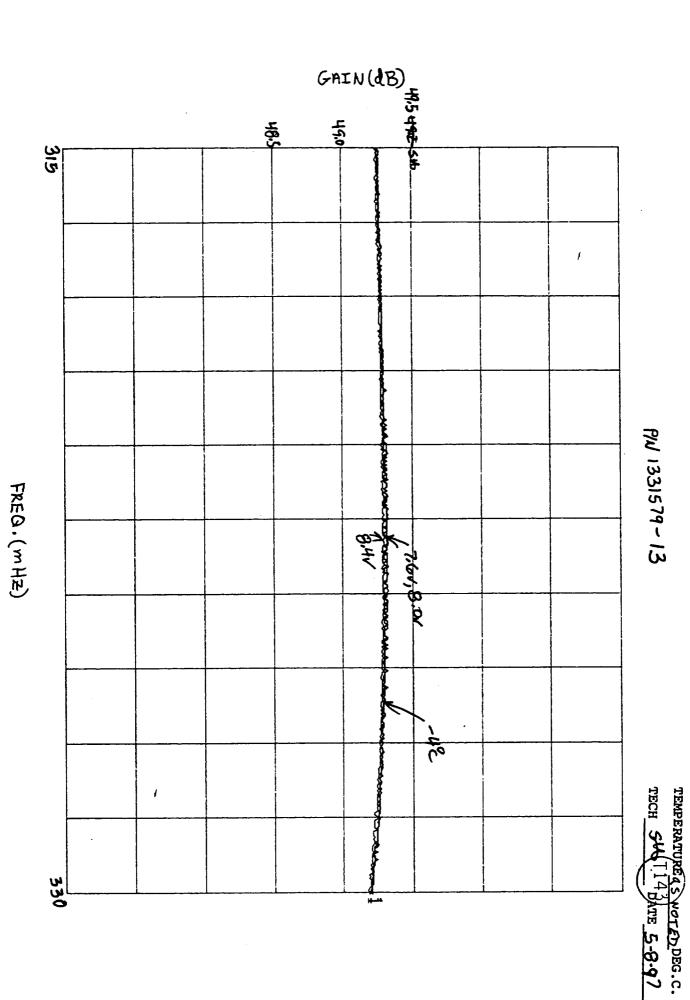


PN 1331579-13

GAIN-VOLTAGE SENSITIVITY VS. FRED.

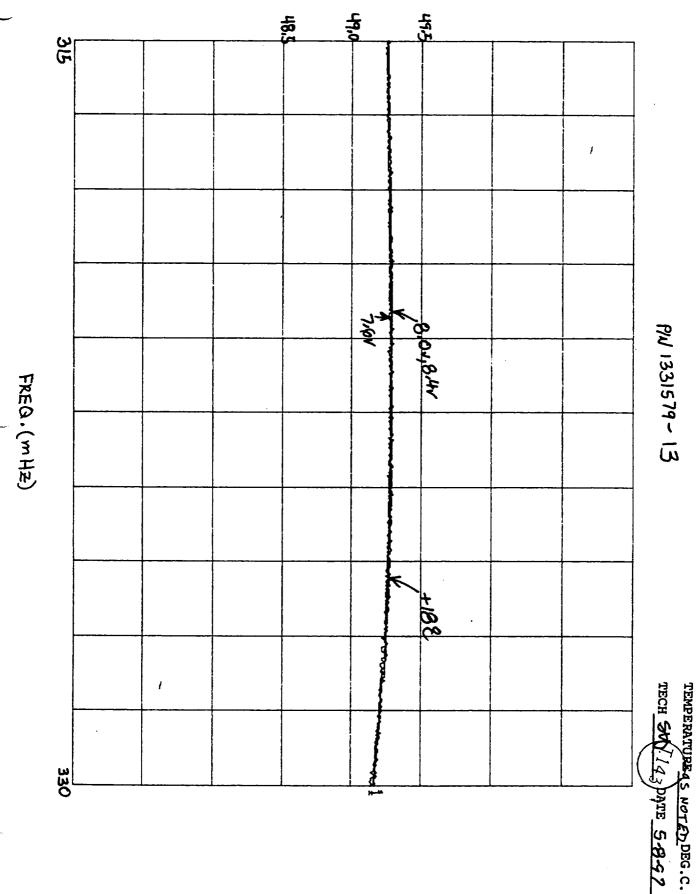
VERTICAL CALIBRATION 0.5dB INCH

MUDEL LD 3/5302 S/N ///



VERTICAL CALIBRATION 0.5dB INCH

GAIN-VOLTAGE SEN TVITY VS. FREG.

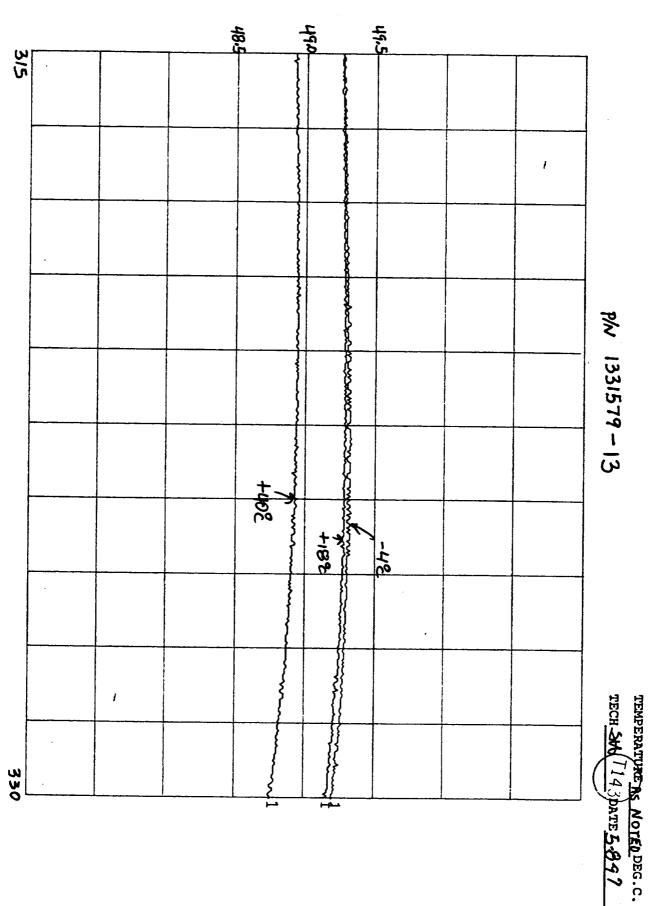


PW 1331579-13

VERTICAL CALIBRATION 0.5 dB INCH

GAIN-VOLTAGE SENSITIVITY VS. FREG.

GAIN (dB)



FREQ. (MHZ)

PW 1331579-13

VERTICAL CALIBRATION .5 dB INCH

GAIN VS FREQUENC

# APPENDIX C ATP1777 DATA SHEET MODEL NUMBER UD315302 AEROJET P/N 1331579-13

s/N\_\_\_\_\_

PARA	TEST	SPECIFICATION	+18°C	400	T	
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept × Reject	-4°C	+40°C	DATE
		315 MHz 322.5 MHz 330 MHz	0.60 dB 0.60 dB	0.65 dB 0.60 dB 0.60 dB	0.55 dB 0.55 dB	5-8-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject			<u>58-97</u>
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 60 mA	Accept_X Reject			
		Maximum Current	<u>51,2</u> ma			5-8-97

NOTE: Review all recorded data and signify acceptant	ce below.
Technician Stoffm (T143)	Date: 5-8-97
Quality Assurance Tune	Date: 5-12-97
CSI: Mila Vien (1)	Date: 5-14-97
GSI:	Date: 5/9/97
· · · · · · · · · · · · · · · · · · ·	

Amplica, Inc.						_	
Newbury Park, CA 91320	SIZE	FSCM NO		λπ	P1777		REV
DRAWN	A	510	25	AI	PIIII		
ISSUED	SCAL	E			SHEET	37 OF	39

# APPENDIX C ATP1777 DATA SHEET MODEL NUMBER UD315302 AEROJET P/N 1331579-13

s/N\_\_\_\_\_

PARA	TEST	SPECIFICATION	1100			
		DIBOTTION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			5-8-97
4.2.2	* Current Limiting	200 mA maximum				
		Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A MA			
4.4	Blectrical Test	,				<u>5-8-9</u> 7
4.4.1	* Polarity Reversal Protection	No Damage	Current  MA mA Accept NA			
	Short Open	No Damage	Reject			<u>5-8-9</u> 7
	Protection	No bamage	Accept_x Reject			5-8-97
	Output Coupling	Output shall be AC coupled	Accept_K Reject		·	5-8-57
4.4.2	Gain vs. Freq. 315 MHz to 330 MHz'	48.5dB Min., 49.5dB Max. -4°C to +40°C Attach x-y plot	Max 47.30dB Min 47.15dB Accept X Reject	Max 49.33 dB Min 49.20 dB Accept_x Reject	Max48,76dB Min48,76dB Accept × Reject	5-8-17
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject O/15 dB	Accept X Reject 0,13 dB	Accept_K Reject 0.10 dB	5-8-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept_X Reject	Accept_x/ Reject	Accept X Reject O.39 dB	5-847
4.4.3	Gain-Voltage Sensitivity	≤.5dB/v Worse Case ± .2dB for 7.6v 7.6 to 8.4 Vdc 8.0v	0.03 dB 47.8 mA 48.5 mA	0,04 dB 46.5 mA 47.2 mA	0.04 dB 48.9 mA 49.6 mA	
	Input Currents	55ma MAX. 8.4v Attach X-Y Plot	Accept X Reject	47,8 mA Accept X Reject	50.1 mA Accept X Reject	<del>58.<b>9</b>7</del>
NOTE:	* TEST PEOUTPET	OF PROPERTY OF				

NOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

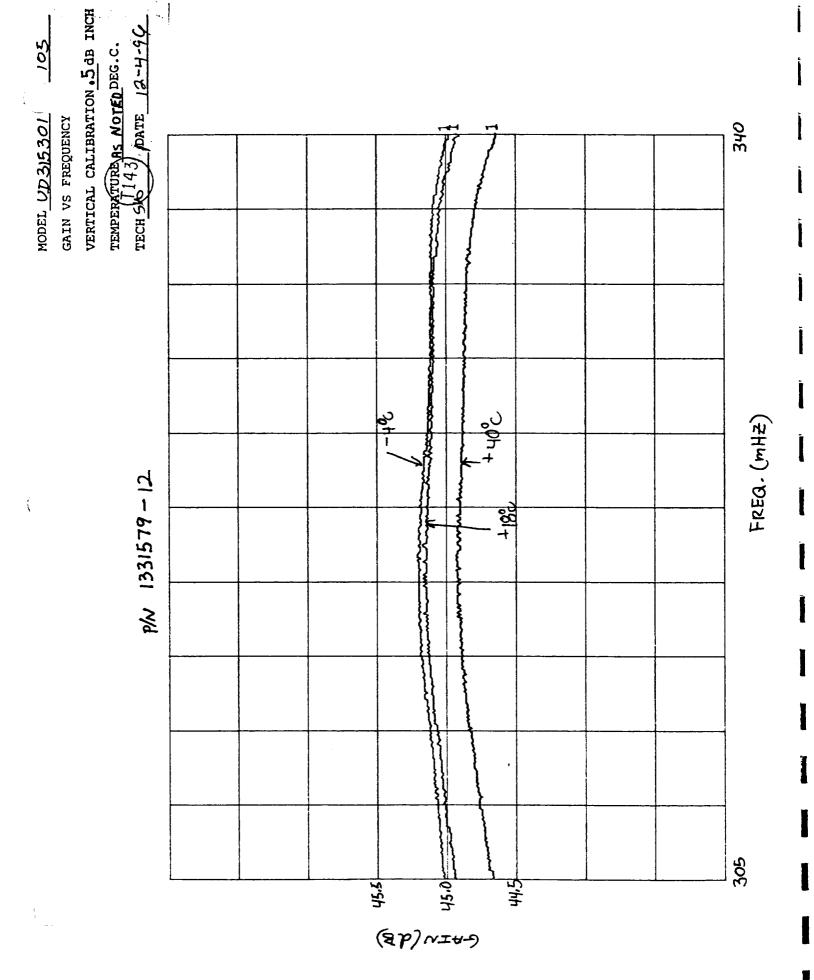
©Amplica, Inc.	1				
Newbury Park, CA 91320	SIZE	SIZE FSCM NO.			
DRAWN	A	510	l l	ATP1777	
ISSUED	SCAL	E		SHEET 35 0	F 39

**Channel 14 Amplifier** 

IF Amplifier (P/N:1331579-13, S/N: 111)

1			

CHIN(4B)



#### APPENDIX C ATP1776 DATA SHEET MODEL NUMBER UD315301 AEROJET P/N 1331579-12

s/N 105

PARA	TEST	SPECIFICATION	+18°C		T	
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept_ / Reject	-4°C	+40°C	DATE
		305 MHz 322.5 MHz . 340 MHz		.60 dB .60 dB .65 dB	.45 dB .50 dB -60 dB	12/4/91
4.4.8	Stability	Unconditionally Stable	Accept_X Reject			12-4-90
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 55 mA  Maximum Current	Accept X Reject			,
						12-5-90

NOTE: Review all recorded data and signify acceptance below	7.
Technician SM (T143)	ate: 12-5-96
Quality Assurance (A23) D	ate: 12/9/96
CSI: Dimbolus D.	ate: /d-9-96
GSI:D	ate: 2/10/97

©Amplica, Inc.						
Newbury Park, CA 91320	SIZE FSCM NO.		).	AMD1776		
DRAWN	A	510		ATP1776	B	
ISSUED	SCAL	E		SHEET 37 OF 39	)	

# APPENDIX C ATP1774 DATA SHEET MODEL NUMBER UD114302 AEROJET P/N 1331579-10

### s/n<u>105</u>

PARA	TEST	SPECIFICATION	+18°C	-4°C		
4.1.1	Examination of Product		Accept X	-40	+40°C	DATE
4.2.2	* Current		Reject			12-3-96
4.4	Limiting  Electrical  Test	200 mA maximum  Reg. VOLTAGE= 6,43 VDC  Total R= 50.5 ohm  max. current draw =				9-19-4Ç
4.4.1	* Polarity Reversal Protection	No Damage	Current  384mA Accept X Reject			12-390
	Short Open Protection	No Damage	Accept Reject			12-3-96
	Output Coupling	Output shall be AC coupled	Accept Reject			12-346
4.4.2	Gain vs. Freq. 255 MHz to 390 MHz	38.5dB Min., 39.5dB Max. -4°C to +40°C Attach x-y plot	Max <u>35.27</u> dB Min <u>38.8</u> 8 dB Accept <u>×</u> Reject	Max 39.20 dB Min 39.64 dB Accept Reject	Max39.07dB Min38.68dB Accept_x Reject_	12396
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.37 dB	Accept × Reject 0.38 dB	Accept × Reject 0.40 dB	12-3-96
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept_X Reject	Accept_ × Reject	Accept × Reject O.30 dB	12.3.45
4.4.3	Gain-Voltage Sensitivity Input Currents	<pre>&lt;.5dB/v Worse Case</pre>	38.6 mA 39.3 mA	0.03 dB 36.2 mA 36.9 mA 37.5 mA	0.01 dB 29.3mA 40.0mA	
		Attach X-Y Plot	Accept X Reject	Accept × Reject	Accept × Reject	12.3.96

NOTE: \* TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

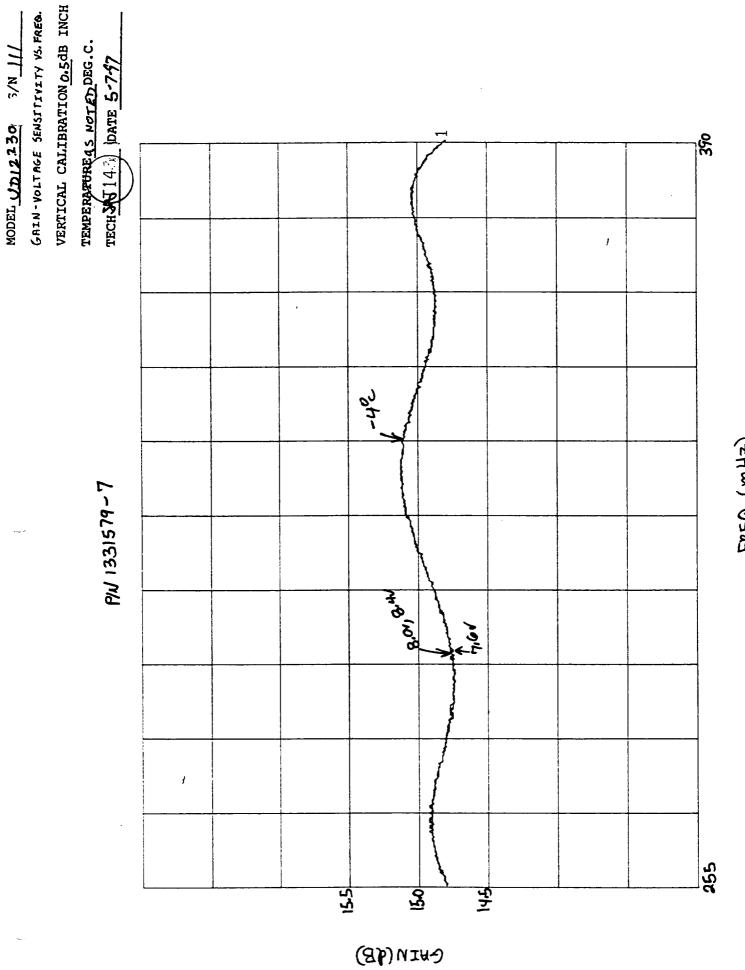
Amplica, Inc.					
Newbury Park, CA 91320	SIZE	SIZE FSCM NO.  51025			REV.
DRAWN	Α			ATP1774	
ISSUED	SCAL	.E		SHEET 35 OF 39	

			_

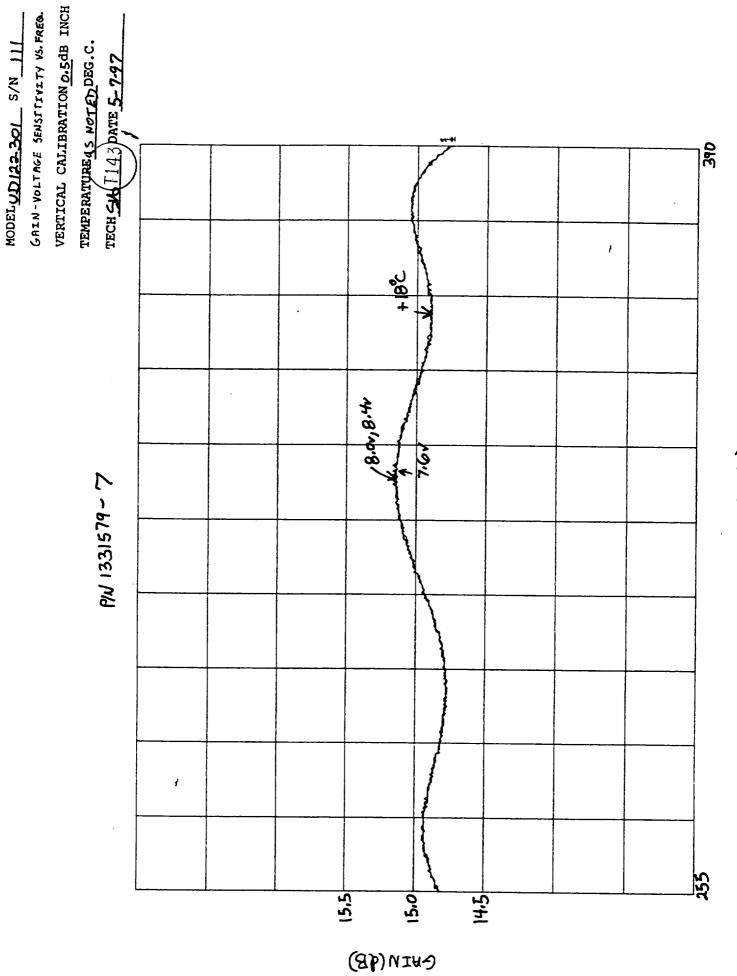
**Channel 11 Amplifier** 

IF Amplifier (P/N:1331579-10, S/N: 105)

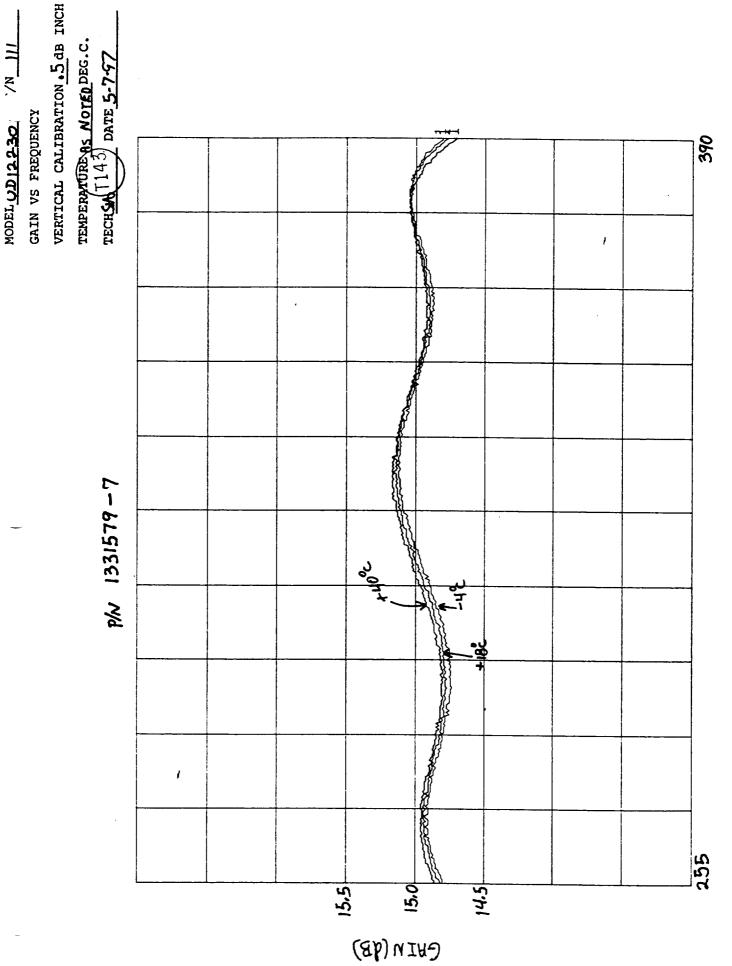
CAIN(4B)



FREG. (MHZ)



FRE (MHZ)



FREQ, (MHZ)

### **REPORT DOCUMENTATION PAGE**

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